WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 08/02/95

..DAY 21

THE COURT RESUMED AT 9.13 A.M.

ANDREW LEONARD GRAHAM, CONTINUING:

WARDEN: Thank you, Mr Clair?

MR CLAIR: I have no more questions, Your Worship.

WARDEN: Witness, you are on the former oath you took yesterday, do you understand that?-- Yes, I do.

Yes, Mr MacSporran?

CROSS-EXAMINATION:

MR MacSPORRAN: Mr Graham, you had some concerns, you told us yesterday, about the ventilation circuit in 512?-- Yes, from time to time, yes.

You explained the basis of those concerns was to do with the larger pillars inside 512?-- Yes.

And certain dead spots, as you perceived it, around those pillars?-- Yes.

And the pillars you described as being in the vicinity of 3 to 4 headings at 4 to 5 cut-throughs and 8 to 9 cut-throughs, approximately?-- Yes, approximately.

And those were the only concerns you tell us that you had with the ventilation circuit?-- During the development stage, yes.

Even then there was no indication, as far as you could tell, of higher than normal methane readings in those areas?-- That's correct.

Did you ever observe or find out about any problems in the ventilation in No 2 heading, the top supply road?-- No, I remember discussion going on about a ventilation problem in that heading, but I had nothing to do with it.

The discussion you heard taking place about that related to re-circulation and some layering, things like that in No 2?-- Yes.

Do you know when that was, approximately?-- No, I can't remember.

There was nothing you observed about that yourself?-- No.

To confirm that the discussion was about the same thing?--

No.

That's the extent of the concerns you had about ventilation?-- Yes.

I think you said you found out about the sealing of that panel when you came to work on the Saturday, 6 August?-- Yes.

And you "heard on the grapevine", I think your words were, that the sealing was taking place because of concern over a possible heating?-- That's correct.

When had you heard that "on the grapevine", as you put it?-- At work.

On that Saturday?-- Yes.

As I understood you yesterday, you can't be more specific about who it was you heard talking about that fact?-- No, I can't. There was so many people milling around at the start of shift on the surface, I just-----

Well, do I understand you to say the discussion was on the surface before the shifts went underground?-- Yes.

And can you tell us whether or not there were other deputies present when such discussions were being had?-- I know one deputy that was present, yes.

Present for this discussion?-- Well, I don't know who was having the discussion. I was just overhearing people talking and whether this deputy was also overhearing the people talking, I don't know.

Was he present in the same vicinity, as far as you recall?-- I would imagine he would have been around that vicinity, yes.

And who was that?-- George McCrohon.

Anyone else you can remember by name as being present or in the vicinity at the time you overheard these discussions?-- No.

So, at that stage, did you understand that the panel was possibly being sealed because of a heating? That was your understanding, was it, from the discussions and the grapevine talk on that Saturday?-- Yes.

That's before you went underground?-- Yes.

With heatings - there are ways that you can detect the presence of heating, aren't there?-- Yes.

What are the ways or the signs of heating, as you understand them?-- Smell.

And what sort of smell?-- I beg your pardon?

What sort of smell?-- What I've experienced before in another

panel, a bitumeny, tarry smell. The section would feel very warm. There would be a dramatic rise in the CO in the return.

We will come to that in a moment, but can we deal with the smell firstly? You have said a "bitumeny, tarry smell"?-- Yes.

Have you experienced that before, have you?-- Yes.

In what circumstances?-- On the sealing of another section.

Which was?-- 5 North or 5 North-west, as it was called.

Was that in 1986?-- I can't say exact - the exact date, but it would have been '86, yeah. I wasn't working at the mine. We were retrieving machinery with Mines Rescue. I was at the No 4 Mine at that stage.

When you say you were retrieving machinery, was that after the panel had been sealed?-- That was after the panel had been sealed, yes.

And had become stable?-- And had become stable, and once the panel was reopened, it destabilised.

You went in with others and recovered the machinery?-- Yes.

And carried on from there. On that occasion you smelled a smell which you attributed to the remnance of a heating, did you?-- Well, I don't know what to put it down to. It could be a number of things.

And you described that smell as what, a bitumen, tarry smell?-- Bitumen, petroliferous, tarry.

Benzene type smell?-- Yes.

Have you heard any other descriptions used for the sort of smell you associate with the heating?-- Stinkdamp.

Stinkdamp, gob stink?-- Yes.

Fire stink?-- Yes.

All of those terms are terms used to describe the sort of smell you get when you have coal heating?-- That's correct.

That was your understanding - that is, those terms all related to heating of coal - that was your understanding as at Saturday, 6 August?-- I beg your pardon?

As at 6 August, the day you came on shift, your state of knowledge was such that the terms you have just described were such terms to describe heatings, fire stink, gob stink, Benzene type smell, tarry smell, tarry bitumen?-- I never heard anything mentioned about that on the 6th, no.

But as at the 6th, you knew that a heating - the smell of it - could be described in those ways?-- Yeah.

And you had heard it described in those ways prior to 6 August?-- I had heard it described in many ways, yes.

But all of those terms relate to the sort of smell you get when you get coal heating?-- Yes.

That's the smell. What other signs are there to enable you to detect a heating?-- There would be a rise in the CO.

Is that CO parts per million or litres per minute?-- Well, anything I would be involved with would be parts per million.

And without covering the ground that you covered yesterday, are you able to indicate what, in your view, would be a rise in parts per million of CO to give you concern about a possible heating?-- Not knowing the ventilation current or the rest of the scenario to figure out the CO make, and what the CO make would have been from the start, a small rise in CO would have been of minimal concern and what I detected in the return on my shift was a small rise in CO of about 2 ppm.

But as you have just said, I think, you would acknowledge that the rise in CO and its significance would depend upon the background CO readings in the panel?-- That's correct. It would also depend on the number of machines that are being used and what is actually going on at the time. Obviously if a section is being sealed at the time, there is going to be an increase in the CO because you are reducing the ventilation into the panel.

So, you really have to thoroughly investigate the situation to-----?-- It certainly has to be thoroughly investigated, yes.

To ascertain the significance of any individual signs that are picked up?-- That's correct.

So, that's the CO parts per million. You have said yesterday that you knew something about the significance of a CO make in litres per minute, although you didn't know the exact figures that were relevant?-- In that situation, I know how to calculate CO make, if that's what you mean.

You know how to calculate it from your Mines Rescue training?-- Yes.

You said that you knew it had some significance; that is, the CO make had some significance?-- Yes.

In respect of the detection of a spontaneous combustion or heating?-- Yes.

But you weren't sure of, I think you said, what per cent or level of litres per minute would be significant?-- Would be the norm, yes.

But you weren't sure what that level was?-- No, that's correct. It would be different in every section of the mine.

As far as 512 panel went, you weren't aware of what the level was of litres per minute at any stage?-- No, not at any stage.

Although you conceded, I think, you saw a graph on the deputies' cabin wall on the CO make?-- Yes.

You can't tell us what litres per minute?-- I would have read it off the graph; whether it was 7 lpm, or the next day it could have gone up to 8 or the next day down to 6.

It wouldn't have meant anything to you because you didn't know what level was significant as far as CO make went in 512?-- That's correct.

You had no way of interpreting the graph?-- That's right.

You never sought assistance to understand the significance of the graph on the cabin wall?-- I beg your pardon?

You didn't seek assistance - that is, ask someone - what the graph meant, was everything okay?-- Yes, I would have asked-----

Did you?-- Yes, I would have.

Who?-- On a number of occasions.

Who?-- I would have asked Alan Morieson what the CO make is doing this week in the panel.

So, you say you would have?-- I did.

You did?-- Yes. On more than one occasion.

On more than one occasion over the life of 512?-- Yes.

What did he-----?-- I would imagine that every deputy would ask the ventilation officer what the CO make was.

No-one is asking you to imagine, you are simply being asked to say what you recall about these events; you understand that?-- Yes.

You understand the difference, do you?-- Yes.

So, you say you spoke to Morieson about what the graph or graphs that were displayed were showing?-- Could I also say that this would just be in general conversation throughout your working week at the mine and it was not like a "sit down at the table and let's discuss what the CO make is doing"; it was just a general conversation thing, same thing as you would talk about every other aspect of the mine during the week.

Are you saying that you had some understanding that the CO make depicted on those graphs in 512 showed a stable position, or what?-- It seemed stable to me, yes.

But you can't now tell us what level in litres per minute any of those graphs referred to at any stage?-- It is written on the graph.

But you can't now tell us from memory what figures were depicted?-- No.

Not even generally?-- Oh-----

Not even whether it was below 10, above 10, over 15?-- Well, generally it would be somewhere between 8 and 14, I would imagine, just from my recollection.

Have you looked at any such graph since the explosion?-- Yes, yesterday.

But before yesterday?-- No.

Have you talked to anyone about the levels recorded on those graphs before yesterday?-- No.

Well, that CO make, what other signs would there be? CO make; CO parts per million; there is smell. What else, if anything?-- I would say the panel would start getting a little bit warmer as the coal begins to oxidise.

So, there would be a change in temperature?-- In temperature and humidity.

And, again, I suppose that would depend to some extent on the air quantity of ventilation and things of that sort?-- Yes.

What about haze? Would that be a relevant factor to be taking into account to detect a heating?-- Yes, it would.

And you knew that as at 6 August last year, did you?-- Yes.

You said yesterday also, if I can return briefly to the CO make question - a steady increase, you said, would indicate things were normal, but that a sharp increase would indicate some cause for concern?-- Yes.

Apart from your experience with 5 North and what you had heard about that, where else, if anywhere, had you learnt to look for a sharp increase as opposed to a steady increase in the CO make?-- I had never learnt to - at the mine to do anything at all with the CO make or the - nothing at all to do with the ventilation or the ventilation control at all. My job was working at the working face. Other people are employed to do that.

Had you seen in any literature reference to a sign of spontaneous combustion being a sharp increase in CO make as opposed to any other sort of increase?-- I can't recall reading that specifically.

Can you recall anyone telling you that a sharp increase was what was to be looked for rather than some other sort of increase?-- Yes, my Mines Rescue superintendent would have

drummed that into us during training.

You say "would have". Do you remember such instruction from your Mines Rescue superintendent?-- No, I don't.

Who was that, by the way?-- I beg your pardon?

Who was the mines superintendent that instructed you?-- Dave Kerr.

Now, you can see, I suppose, it is a combination of the signs of spontaneous combustion that have to be assessed; is that right?-- Yes.

Any given sign might not have a lot of significance on its own?-- That's correct.

A combination of such signs may assume significance; is that right?-- Yes, you would assume so.

If, for instance, you had a CO make that was showing a steady increase, your view would be that that was no cause for alarm or concern because you would be looking for a sharp increase?-- Yes.

But if you coupled such an increase in CO make with, for instance, a smell, however you describe it - Benzene, tarry, petrolly, fire stink, gob stink - you coupled a steady increase in CO make with that, would you have more cause for concern?-- You certainly would.

If you coupled that with a haze, would that be further cause for concern?-- It certainly would.

What really concerned you on the sixth when you came on shift was that there had been a report of a benzene type smell in 512; is that right?-- I'd heard there had been a report of a benzene type smell and a haze.

And a haze?-- Yes.

That concerned you, didn't it?-- Yes, it did.

It concerned you because it was a sign of some sort that there might be a heating inside 512?-- That's correct.

And for that purpose you went down to investigate yourself?-- Mmm.

Whether you could find the source of it or if it was still there, for instance?-- If I could detect anything myself, yes.

And you went down and you detected a smell consistent with a sign of a heating?-- No, I did not.

You didn't?-- No. I walked into the return and smelled a slight musty smell.

A slight musty smell?-- Musty smell. The return was warm. There was no haze, and like I said yesterday, I walked into the panel, had a look around and could see nothing to warrant any more investigation.

Now, you say a slight musty smell?-- A slight musty smell.

Do you mean to consciously distinguish that from any smell associated with a spontaneous combustion?-- It's certainly distinguishable. If you smelt fire stink - fire stink is fire stink, musty is just musty.

Totally different smells?-- Yeah.

You can't confuse the two, can you?-- No.

You spoke to Mr Walker, the district inspector, after the explosion, didn't you?-- Yes.

You gave him your detailed account of your recollection of the events of Saturday, 6 August?-- Yes.

And you were given a copy of that statement, were you?-- Yes.

And you read it?-- Yes.

And you signed it?-- I don't think I signed it. Yes, I did.

You did, yeah. You were asked to sign it, weren't you?-- Yes.

And you were asked to sign it if it were true and correct?-- Yes.

And accurate?-- Yes.

And you did so?-- That's correct.

The interview was conducted with you on 18 August?-- Yes.

Reasonably soon after the events of the sixth that you spoke about in the statement?-- Yes.

Well, do you stand by what you said in the statement?-- Yeah.

Have you read the statement recently?-- Not recently, no. I've had a flick through it, read a bit yesterday.

Could I ask you to have a flick through page 2 at the top? You see that top paragraph? Just read that?-- Yes, I can see where you describe - pertaining to -----

It's not what I'm describing, it's what you've described to Inspector Walker on 18 August, isn't it?-- That's correct, yes.

Is this what you said?-- That would be exactly what I said.

"I was involved with a sealing of 512 on the afternoon shift of Saturday, 6 August. After doing some of my outbye duties I went into 512 at about 4.30 p.m. just to satisfy my own curiosity about the benzene odour reported by the deputy on the previous shift. I saw the deputy, George McCrohon, and George Mason, undermanager in charge. I went by myself and inspected the seals being built in both the intakes and the returns. Although I detected about 8 to 10 ppm with the Drager 21/31 at the top return seal area I also detected a very faint odour that reminded me of fire stink. I saw no haze or visible vapour."?-- That's correct.

Well that's a bit different to what you said yesterday and today, isn't it?-- That is different, yes.

In fact it's totally different, isn't it?-- Well, by fire stink and musty smell, yes, I would say it would be different, but I would have -----

Totally different?-- Beg your pardon?

Totally different?-- Not totally different, no.

You told us a moment ago, I thought, that the two smells were totally different, couldn't confuse the two?-- You could if it was faint, I would imagine.

Is that what you are saying now?-- I don't really understand the question to be quite honest.

The question is this, Mr Graham, very simply: on 18 August last year when you spoke to Mr Walker about the events of 6 August you reported going into 512 and smelling a faint odour which reminded you of fire stink; is that so?-- That's correct. That's what's written here.

Fire stink you have acknowledged is a smell you associate with spontaneous combustion or heating of coal?-- "That reminded me of fire stink" is the pertaining word - words. I don't know why I would have used that answer, I would imagine, where it's got "very faint odour that reminded me of fire stink". It was a slight musty smell that reminded me of fire stink. Whether it was or not was - further investigation - as I said, I walked further inbye, could see nothing, wasn't concerned in any way and left the panel.

Well, you had a report of a benzene odour having been detected in the panel. That caused you concern, we have been through this?-- Yes.

That's why you went down to check whether you could see any signs of any heating?-- That's correct.

You went down and you told Walker that the smell, whatever it was that you detected, faint though it might have been, reminded you of fire stink?-- Reminded me of fire stink, yes.

Similar to fire stink?-- Whether it was or not is -----

Well, the fact that it reminded you of fire stink would have caused you some concern?-- It didn't cause me any concern, no.

Well, fire stink is a smell associated with heating?-- Maybe I used "fire stink" in the wrong context where I wanted to say it was not a benzene or petroliferousy type smell, it was more of a musty, sticky smell.

That's not what you said, is it?-- In the statement, no, it's not.

The statement you signed as being true and correct?-- Yes, that's correct.

You also said in that paragraph that you had - the benzene odour was reported by the deputy on the previous shift; is that so?-- Yes, it says that.

Well, do you remember who that deputy was?-- No, I don't.

Was it Cole Klease?-- In retrospect I know it was Cole Klease, but I don't know who said it until after that date.

But is the statement correct, is what I'm getting at, when you say that the benzene odour that you became aware of had been reported by the deputy on the previous shift to yours on that Saturday?-- I didn't become aware of any benzene odour.

I'm just trying to work out what you said there in the first paragraph?-- I'm just trying to answer your question.

See what you have agreed to in the paragraph?-- Yes, I do.

"Benzene odour reported by the deputy on the previous

shift."?-- Yes.

What did you mean to convey by saying that in your statement of 18 August?-- Well, that's why I went down the mine.

But did you mean to convey that the benzene odour had been reported by the deputy on the shift before yours on the Saturday?-- Convey to whom?

To you?-- To myself?

Yes?-- I don't understand your question, I'm sorry.

Sorry, I might be being difficult. I'll repeat it. The first paragraph refers to you becoming concerned about hearing about a report of a benzene smell in 512?-- Yes.

And the way you phrase it in the first paragraph is the benzene odour was reported by the deputy on the previous shift. Now whether it be to you or someone else doesn't really matter, but were you saying there that you understood it was the deputy on the previous shift that had reported a benzene odour in 512?-- Yes.

And you now know the deputy on the previous shift was Cole Klease?-- Yes.

You didn't speak to him yourself?-- No.

But you learned that he had reported a benzene odour on that shift before yours?-- Yes.

Is that correct?-- Yes.

So you knew on 6 August that the smell we are talking about, consistent with a heating, had been detected on the shift previous to yours?-- Yes.

And that's why you went down to check the smell?-- That's correct.

And anything else?-- That's correct.

Having gone down you detected a smell which reminded you of fire stink?-- Well, that's what I've got written there, but
-----

But you don't want to stand by that?-- I have to stand by it because it would have been a very - it would have been a musty, stinky smell that reminded me a little bit of fire stink. Definitely no benzene or petroliferous smell.

You see, you at that time, as you've told us, you were aware that the word was going around that this panel was being sealed because of a suspected heating?-- That's what I had heard, yes.

That's what you had heard?-- Yes.

And you had smelled a smell yourself on the Saturday which you've described previously as being consistent with heating?-- I didn't say it was consistent with heating, no.

Earlier on you talked about fire stink being a way of describing a smell associated with heating?-- Yes, but -----

Not on this occasion?-- Beg your pardon?

Not on this occasion?-- Not on this occasion, no.

Anyway, thereafter, as far as you were concerned, the sealing progressed in the normal fashion?-- Yes.

And there were no signs that you detected of any spontaneous combustion in the panel?-- No.

Thank you.

CROSS-EXAMINATION:

MR MARTIN: If I just might take you to your statement as well to clear something up for me at least, on the second page at the top you talk about finding readings of 8 to 10 ppm of carbon monoxide with the Drager?-- Yes.

I just take you down the page then to about half-way down. You say, "During my duties in 512 in the top return" - you noticed a rise, or found a rise in carbon monoxide of 2 to 3 ppm?-- Yes.

Is that on top of the 8 to 10?-- Yes.

Just dealing with the 8 ppm that you first found and then the 2 to 3 ppm which you later found, and just dealing with, say, the 2 ppm increase, that's a 25 per cent increase, is it?-- Yes, it is.

Had nobody ever told you that 25 per cent increase on a per cent was a concern?-- Thinking about it now it would be a concern, but I certainly didn't think about it then.

Had anybody ever instructed you -----?-- No.

----- that it was a major matter?-- No.

Or indeed if you take the higher level, 10 and -----?-- I would -----

And 13, that's really something in the order of 33 and a third per cent?-- The panel was being sealed and you would expect a continual rise in the CO.

Yes, but my question was -----?-- Because it's flushing all the CO that has accumulated in the panel out with the

increased ventilation.

But I was just curious as to whether anybody, whether at the mine or at Mines Rescue, had ever instructed you that that was a significant matter which you ought to consider?-- Not as far as I can recall.

Isn't the most important feature in relation to spontaneous combustion the fact that it's possible that it may happen, that it may occur?-- Yes.

And particularly important is the fact that it has occurred previously in a particular mine?-- Yes.

Or nearby?-- Yes.

In a similar coal seam?-- Yes.

Were you never taught that, for instance, that 10 lpm was an area where great concern and vigilance should commence?-- No.

Let us take you back to that top paragraph on page 2. When you say you saw Deputy McCrohon and George Mason, undermanager in charge, when you went down at about 4.30, do you see that?-- Yes.

Where were they? Where did you see them?-- As far as I can recall they were in the panel.

Can you help the Inquiry with the position within the panel?-- Around the sealed sites. I can't be specific, but it would have been around No 1 - 0 cross-cut area.

Did you see them more than once on that shift?-- Yes.

In that vicinity?-- In that vicinity, yes.

Tell us how many times?-- Within the space of the half-hour I was there I would have, I don't know, seen them a hundred times, I suppose. They were there and I was there. It's not very big.

And when you were telling my learned friend about the smell reminded you of fire stink, did you tell Mr Mason about that?-- No.

Just coming to the commencement of the night shift, and you then sat, as I understood you yesterday, in the Unor room?-- Yes.

Mr Mason told you to do that?-- Yes.

For what purpose?-- To keep an eye on the Unor system and raise the set point alarms as they came up on the system as the panel was being sealed.

Had you ever done that before?-- Beg your pardon?

Had you ever done that before?-- Yes.

Before that day, that night?-- Yes.

When?-- I can't recall when exactly it would have been. I have done it before if an alarm has gone off and on other sealing occasions.

More particularly I am concerned with sitting there for really the whole of the night shift?-- Oh, no, no. It was just a five minute job if an alarm went off.

So, this is a first occasion you, as a deputy, have ever spent your entire shift monitoring the Unor system?-- Yes.

Do you know of any other deputy who has been so instructed to spend his entire shift -----?-- No, I don't know of anyone.

Did Mr Mason indicate any concern of his which led him to issue that instruction to you?-- I don't know that it was concern. That was just the norm. That's what would be done during a sealing.

Or after a sealing?-- Or after a sealing.

Well -----?-- During the latter stages.

During the latter stages of the sealing and after the sealing was finished?-- Yes.

And you sat there all night?-- Yes.

Acknowledging very, very promptly any alarm that came up?-- I acknowledged any alarm that came up as quick as I could, and also acknowledged a couple before they came up to stop the hooter going off.

And when you left or finished your shift, did you tell any person of the position which had existed throughout the night as you found it?-- No, I don't think I did.

When you left did anybody take over from you?-- Not that I can recall, no. I didn't see anybody take over.

From you?-- No, nobody took over from me. I finished my shift and went for a shower.

Was there an undermanager there?-- Yes.

Who was he?-- I can't recall who it was.

Was it Michael Squires?-- Because he was on shift that weekend it probably was, but I just can't remember.

Did you report to him before you left?-- Yes, I would have.

Or whoever it was?-- Yes.

Did you tell him what you had been doing for the night?-- I certainly would have, yes. I have no report to fill out, so it would have been just a verbal -----

It's not a question - see, the term "would" confuses lawyers. It's did you or didn't you?-- I don't know.

Well, you said you would have?-- Yes, I would have.

But did you?-- I don't know. I can't remember.

Anyway, the fact is that when you left nobody replaced you within the monitor room that you know of?-- That I know of, no.

And did the undermanager know that that's what you had been doing for the night, sitting in the monitor room?-- Yes. I told him that's what I was doing.

Do you know of implements, gas detection devices, called multiwarn?-- Yes.

What does that do? Is that a digital accurate, so far as you know, device to test for, amongst other gases, carbon monoxide?-- Yes, it is.

In terms of comparison in accuracy with the Drager tube system, can you tell us anything about that? Is it more accurate?-- I'd say they would be pretty much on a par.

So far as you know?-- As far as I know.

Do you know whether at the mine, that's Moura No 2, there was a quality assurance program where people -----?-- I heard about a quality assurance program.

Whereby some persons were authorised to do some jobs and only

those persons would do those jobs?-- I wasn't aware of that.

Do you know whether you were an authorised person under the quality assurance system to operate a Unor?-- No, I don't think so, no.

Were you ever trained on the Unor machine?-- No.

How did you pick up what you knew?-- It's just a computer.

I beg your pardon?-- It's only a computer. It's pretty straightforward. It tells you what to do, and once you have done it once it's pretty easy.

Had you ever been trained to produce the Ellicott Diagram or, for that matter, the Coward Triangle or Graham's Ratio?-- No.

Had you ever asked management to be trained on the Unor?-- Yes.

What was the response to that?-- "It'll get done, you'll be trained."

But you weren't?-- I wasn't, no.

And without going laboriously through the same questions, what about the gas chromatograph, same situation?-- Not allowed to touch it.

Had you ever asked to be trained?-- Yes.

And what was the response?-- "You'll be trained."

Could you tell us this too, coming back to the multiwarn and siphor - do you know of a siphor 2 instrument?-- Beg your pardon?

Do you know of a - I think it's called -----?-- Siphor 2.

Siphor 2. Do you know of that instrument?-- Yes.

Can you tell the Inquiry whether either or both of a multiwarn and a siphor 2 were at the mine by 7 August?-- I wouldn't know if they were or they weren't.

You said yesterday in your evidence that you found a regulator knocked down, or down in the 510 panel but outside No 1 return or thereabouts for 512 Panel?-- Yes.

How long was it down for?-- I don't know.

What time did you restore it?-- As far as I can recall, it would have been approximately around about 10 o'clock, 10 p.m.

10 p.m. on the Saturday night?-- On the Saturday night.

Do you know anything about the probeye machine, device?-- I

know what it is.

Was there one in the Unor room?-- I don't know if it was there that night, but I have seen it around the mine.

Have you seen it used in the mine?-- I have seen it used, yes.

For what purpose?-- Detecting a heating.

So far as you know, has it detected a heating?-- Beg your pardon?

So far as you know, has it detected a heating?-- As far as I know, yes.

Did you know how to use it?-- No.

In relation to the sealing of a panel, not particularly 512 but any panel sealing, is there any safety discussion either before or after by management with men in relation to the sealing?-- No, I wasn't present at any, no.

Do you know of a meeting which took place with the sealing, or the gang intended to do the sealing at about 3 p.m. in the afternoon of Saturday where all the men were gathered together on the surface and addressed by one of probably Mr Squires, but one of Mr Mason as well?-- No, I can't remember that. I could possibly have been doing something else at the time.

I think you said you were in the deputies' cabin at some stage?-- Quite possibly.

You said yesterday, I think, that you were using a touch screen on the evening?-- Yes, I said that.

I suggest to you in fact that there was a different sort of system?-- I'll agree with you.

Well, what sort of system was it?-- I can't really be absolutely positive. I'd only - I've been up most of the night thinking about it, and I just can't remember whether it was a touch screen or the mouse that was being used at the time.

In any case, whether it was one system or another, does the nature of your evidence change from yesterday?-- Beg your pardon?

Whether it was the touch screen or some other system, do you want to change any of your evidence which you gave yesterday in relation -----?-- I would like to, yes.

What would you like to change?-- I would just like to say that I can't recall what machine was being used at the time.

All right. Thank you.

CROSS-EXAMINATION:

MR MORRISON: Thank you, Your Worship. Mr Graham, you had had a bit to do with 512, but in the comparison with other panels not a lot?-- That's correct.

You had been a number of times on development and then only a short time on extraction?-- That's correct.

I am talking now, you understand, as a production deputy?-- Yes.

You might have gone there for other reasons, who knows, spare panels, walking the belt, I'm not sure, but certainly as production deputy there was fairly restricted opportunities?-- Yes.

I just want you to have a look at your reports for 512 simply so we can really establish - it's document 174 - we can establish just what that association was and you can be certain then rather than just trying to remember things pulled out of the past, you can actually have the documents to look at so we can understand with truth what's going on. Now, the first one - might I say, these are - so far as we can detect by going through all of your reports - these are all of your production reports for 512. The first one is 10 April, it's numbered 1797; is that right?-- Yes, that's correct.

I will read the numbers to you and the date and you can tell me if I am wrong rather than tell me if I am right?-- Yeah.

And we know extraction started on 29 April, so this is development stage, and that's your signature, and the document reveals two inspections as is customary for production deputies to report upon?-- This was not a production report.

I'm sorry, it says "production deputies report"?-- It's a production deputies report, but it wasn't a production day.

There wasn't production happening, of course?-- No.

Because they were dusting?-- Yes.

I am sorry, I didn't mean to try and suggest otherwise. Two occasions of inspection at that stage, and on each time ventilation was described by you as adequate, and that's a term used by deputies to signify that there is air moving through the panel?-- Yes, that's correct.

And that's certainly the way in which you would use that term in these reports - that you have actually got a positive air flow through the panel?-- Air flow through the panel.

In 1798 on 12 April - or is that 11 April; can you confirm that?-- 11.

12?-- 11.

There again, no production as such, prep seal work being done, or maybe there was production on the afternoon shift, or on the second part of the shift, I'm not sure?-- No, there would be no production on the second part.

All prep seal work?-- All prep seal work.

Same description for the ventilation on those occasions. Nothing of any particular note?-- Just that the roadways were dusty and required dust suppression.

That would normally be watering, or-----?-- Either watering or calcium.

The next one, 16 April, number 3014, the fitter was working on the miner and no down-time is recorded at the bottom, but I suspect that without knowing that the miner was down the whole shift?-- Yes, it would have been.

Ventilation again gets the same description as before. If we turn to the next one, 17 April, 3018, I can't tell from that if it was production or not. You may not remember. There may be something about the document that would jog your memory?-- No, it's not a production.

Of course, it is Sunday afternoon shift - weekends aren't in production until you get to Sunday night?-- Sometimes you produce on the weekend.

Ventilation again bears the description I have talked about. If we turn to the next one, which I think is 1 May, 3061?-- 1/5.

Yeah, 1 May. This is after extraction had commenced, or very soon after that. It is a Sunday afternoon shift, so can I take it production actually wasn't going on?-- No, production wasn't going on.

Ventilation again bearing the description that you have given before?-- That's correct.

On 2 May, that's the next day, Monday night shift, that's actually the shift that starts, as you would call it, on Sunday night, about 10 or 11 o'clock Sunday night?-- Yes.

That's number 3062. That would have been a production shift in the normal course of events?-- If that panel was to be worked, it would have been a production shift in that panel.

Nothing of any note. Ventilation described as before. Then

the next one, 4 May, 3068. Now, you have got down here the description again of ventilation as before, but I think we can see this, in fact, was production you were punching in the 13 cross-cut?-- That's correct.

Now, as we look at the map over your right-hand shoulder, you will confirm for us, I think, what we are talking about is right at the back of the panel - the very last cross-cut is number 13?-- That's correct, yes.

Between roadways 3 and 4 is the belt road and the next one down 1 dip?-- That's correct.

Ventilation bearing the description you referred to. If we can turn to the 5 May, 3071, same things in terms of ventilation, no indication of the cross-cut here, but certainly cutting in sequence 5. That's again down in that 13 cross-cut area, I think?-- There is no sequence plan on there, but I would imagine that would have been where it was - just the same the next day.

I can show you one. Exhibit 85 is a plan that shows where each shift was working, taken from reports and from sequences. I will have that shown to you. We are talking about Thursday night shift, 5 May. If you look down-----?-- Yeah, up in the top return between 4 and 5.

Okay?-- 5 and 6, sorry.

It is not the top return, I don't think, is it?-- The roadway before the top return.

Bottom return?-- Bottom return, sorry.

It is what we might call roadway 5 between 12 and 13 cross-cut?-- Yes.

And if we can turn to the next report, 3089, 11 May. A production shift again, as you can see from your report, and if we look for that one, I think you might find that it is roadway number 4, again between 12 and 13?-- Punching bottoms in sequence 12 and 13, wherever that was.

If you look at roadway 4 intersection with cross-cut 12, so you are working back through those bottoms into the intersection?-- Yes.

Ventilation bearing the description you have given it before. If you turn the page to 13 May, 3095, you mention the ventilation has the same description. That, I think, though the report doesn't make it clear to me, was also - no, is non-production?-- Non-production.

Non-production on Friday night. Non-production, but ventilation described as adequate. Now, the next one in sequence should be 14 May, 3099?-- That's correct.

That's a Saturday day shift, non-production, ventilation described on each occasion of inspections as adequate in the

sense which we have been discussing?-- Yes.

Next one, 3903, 15 May, non-production, same description of ventilation on that occasion too?-- That's correct.

And then 14 June is the next one, 3991. I'm not sure if I gave the number for 15 May. That was 3903. Then 14 June is 3991. Ventilation bears the description that we have discussed on each occasion of inspection, and was that a production shift? I suspect not because of the Queen's Birthday holiday?-- It doesn't look like a production shift.

And then the last report is the one that brings us up to the time of sealing. As we can see from the reports we have just looked at, there were a few occasions on development, a short period all centred around 13 cross-cut and down around roads 4 and 5, half a dozen occasions of that, all around May and all around that position, and then the isolated occasion in June, which was non-production. Now, the last report is 6 August, isn't it?-- Yes.

That's 3777. Now, can I just draw your attention to one thing straightaway? You probably weren't shown this document when your statement was taken by Mr Walker?-- No.

That's the case, isn't it?-- Yes.

You weren't shown it. Had you been shown it, it would have helped your memory; there is no question about that - wouldn't it?-- Yeah.

And trying to draw things out of your memory, especially then, a fortnight after the incident, must have been very hard when you are not given the actual contemporaneous records; would that be a fair comment?-- Yes.

Just pausing on that point for a moment - let me understand it correctly: those statements were taken very soon after the event, weren't they? They are a fortnight after this event?-- Yes.

You, in particular, as a person who was trapped down there, were being asked to recall very detailed matters at a time which must have been very emotionally disturbing for you?-- Yes, that's correct.

As I understand it - tell me if I'm wrong - you did stay on for a period after the explosion, in what you might call a security role or a watchman role?-- Yes.

But you have been on stress leave since?-- Yes.

You would agree, wouldn't you, that there are obvious risks in taking statements from people when they are in the sort of state of mind you were in so soon of such a traumatic event?-- Now I would say there would be, yeah. I have never experienced it before, so-----

No. And here's a good example of it. Here's a really good

example when you were asked by Mr Walker to recall what the reading was on the first occasion you went in; he has got down 8 to 10 in his statement?-- Yes.

When in reality we can see it is 7?-- That's probably just - that's not - the top part of the report is not my report.

Isn't it?-- That's Mr McCrohon's.

Oh, McCrohon found 7?-- And 7 or 8, just with your eyesight from a different person looking at a tube is-----

Oh, yeah. What I'm getting at, though, is when you made your findings the first time you were in there, what you found was what had been reported before - that's what you told us?-- Yes.

It was consistent. We know what was found before was 7?-- Yes.

That would lead one to the conclusion, with the benefit to think about this over a period of time, if you had found what had been found before, almost certainly you found what was said?-- If I saw 8 with my eyesight on the scale I was looking at - but it is not a variated scale or digital thing-----

There is room for error in it. It is one of the difficulties with a Drager tube. One person might say 7, or 8, or 9 for that matter. You can get quite a variation, depending on people's eyesight and their perceptions and so forth?-- Yes.

People know about that problem, don't they?-- Yes.

It is not as if it is something new?-- No.

People work with Drager tubes knowing there is that propensity?-- Yes.

All right. Can we just pause briefly on that report, which was 6 August. The second inspection annotation is yours?-- That's correct.

And bears your signature on the report. I take it it hasn't got Mr McCrohon's simply because you were sharing the shift?-- Yeah, that's correct.

There is nothing in his report that you disagreed with, though?-- No.

And for your comments, can I ask you this: from what I understand of your background, you have certainly been in the mines a long time and are a very experienced deputy; is that right?-- Yeah, okay.

Don't feel you have to be modest about this, because you are quite an experienced deputy?-- Yes.

And by comparison with some others, well trained?-- Yes.

You are a long-time mines rescue member?-- Yes.

In the course of that mines rescue work, not only have you done the practical exercises that they have had, but you have also had the tuition of Dave Kerr and others repeatedly over time?-- Yes.

That's covered a whole host of areas to do with mines rescue, safety, including things like CO makes, spon com, signs of heat, what smells mean and all that sort of stuff?-- That's correct.

Even down - well, no, I won't bother with the rest of it. And all of your training would have been, I suggest - and, in fact, your own conduct over the years would have been that if things were important, dangerous to safety, you would certainly have reported them in your reports and you would certainly have brought them to the attention of the appropriate people?-- I certainly would have.

It is obvious and sensible behaviour, isn't it?-- That's correct.

And, in fact, it is exactly what a deputy has to do if he perceives such a situation?-- Yes.

Otherwise he would not be discharging his duties either to himself or to his men, or to everybody in the mine?-- That's correct.

And it is one of those truisms that people say that, in fact, it is the reality, I think, that every man is his own safety officer down the pit, but people are given special duties; they have a supervisory role, and deputy is one?-- Yes.

But certainly deputies probably don't regard themselves as management, do they?-- No.

They regard themselves as miners?-- That's correct.

People shouldn't perceive deputies as being either from their own perception or otherwise as part of management. They would really consider themselves to be and behave as though they were part of the mining community - that is the miners?-- Yep.

Looking at this second bit of the report for 6 August, if you had detected a smell down there that you considered was a sign of heating - Benzene, or petrol, or all the things you have described - there is no question it would be in the report, is there?-- No question.

It would just be completely contrary to all your training and all your experience and all of your own personal behaviour to leave out something as important as that?-- It certainly would be.

And does now seeing that report - which you didn't have when

you made the statement - but now seeing that, does that reinforce in your mind what you have told us today and yesterday about the fact that you did not get a smell that was a sign of a heating to you?-- Yes. Mr McCrohon and I were both in the return and neither of us detected anything out of the ordinary, as petroliferousy or-----

In fact, I think there might have been some comment passed between you two about that?-- Yes, there was. I can't remember exactly what the comments were.

What was the gist of it, though? No-one expects you to remember precisely, Mr Graham, but just the gist of it?-- The gist of it in my mind was I was wondering what all the panic was in sealing the place.

You couldn't see any reason for it?-- No.

In fact, did you, in fact, make that comment to Mr Klease?-- Yes.

When he came down, I think that was about 11 o'clock, 11.30, something like that in the evening - he came down to relieve you, finally, when you went up-----?-- Yes, that's correct.

I think you might have passed that comment to him at that stage?-- I don't know whether I passed that comment to him at that stage or the shift previous. I didn't get much of a response from Mr Klease on that change of shift. I was trying to explain to him what I had done during the evening and-----

This is 11 o'clock Saturday night?-- 11.30, yes.

11.30, sorry, yes?-- And I don't know - I don't know what was wrong with the man. He seemed as if he was upset with me, probably because of my comments to him before - earlier in the day.

That's about-----?-- About the sealing of the section, so-----

Sorry, can you tell me what those comments were?-- I wondered what all the panic was about.

Did you tell him why you wondered that?-- Yes, but I can't really sort of repeat that here.

I think you can. Would you?-- No.

Is it very strong language?-- I don't know whether it was strong language, but it was, you know - you know-----

In mining terms?-- In mining terms it was less than strong, but I couldn't repeat it here.

This was a description of his performance, as it were?-- Not his performance, but probably just venting my-----

Spleen?-- Yeah.

You used some - in mining terms - perhaps not the strongest language miners use to each other, but certainly more strong than you would want to repeat here in this Inquiry to him about your view of what was going on?-- Yes.

And you think he might have taken exception to that?-- I would have if it was the other way around, yeah.

I see. And do I understand you rightly to say do you think that might have coloured his response to you when you made these comments?-- Yes.

In fact, the way he responded at changeover at 11.30?-- Yes.

So, you were - let's stay with 11.30 at the moment if you wouldn't mind? You were trying to tell him what had happened for the period you had been down there?-- Yes, the main thing I was concerned about was that I had to rebuild the regulator and we had to actually stop sealing because it was too much pressure on the seals themselves and the Tecrete was getting sucked through by the air pressure.

You mean sucked through the mesh is what you mean?-- Yes, sucked through the mesh and the hole where you are building your-----

You are talking about the wet Tecrete?-- Yes.

Not powder?-- No.

So, you were explaining that to him-----?-- Well, I was trying to - it was like from me to you conversation away.

In-----?-- He was still moving, and I was ready to go.

And can I just ask you about that regulator? You told us yesterday, and I don't want to go over that ground again, and you mentioned it now, that there was that question of pressure, and you went to find out what was going on, basically?-- Mmm.

When you found the regulator, part of it had been knocked down?-- Yes.

And that, as you perceived at the time, I assume, was because people had to get machinery through?-- I assume. That's the only way they could have got the machinery and the equipment through.

The stuff from 4 South would have come that way probably?-- Yes.

As you look at it, walk out the top return towards the regulator - as you looked at it, which side, or was all of it down?-- Most of the right-hand side from half-way across.

Now, can you just tell me what you did to repair it?-- Put up some brattice cloth over the remaining structure that was

there, and pinned it up to the rib as best as I could.

So, actually put it over the hole, or over the other part?-- No, I put it over the other part that had been broken down and left the normal intake - the return air hole as it was - as it should have been.

Okay. So, prior to being knocked down, it would have had that general appearance in the sense of a-----?-- It would have had three holes in it and - three doors in it and two holes.

Okay. The panel that was there before, was that a Tecrete panel of some sort - the one that had been knocked down - the part that had been knocked down? Do you remember what that was made of? Was it a Tecrete covering over batons?-- Yeah, batons and brattice.

Can you recall roughly, or even maybe more accurately, I don't know, about when that would have been? Was that early in your period down in the seals?-- No, it was later on, around the 10 o'clock mark.

You didn't do the work yourself, I take it, you got men to do it?-- No, I did the work myself. The men were building the seals.

And when you were doing that I take it you weren't sort of redoing what someone had done before you, putting up someone else's repairs that had simply fallen down, you were effecting new repairs?-- Yes.

And you can't tell us, for obvious reasons because you had only come on shift not that long before, how long it had been in that state?-- No, I can't. Not with any accuracy.

One would assume - without knowing accurately one would assume it must have been since they knocked it down to get machinery through because you weren't redoing someone else's repairs?-- No, that's right.

They were fresh ones?-- They were fresh.

No sign that someone else had tried to do it?-- No.

Can I take you back to that report while it's still in front of you, the 3777 report. George McCrohon is also an experienced deputy, isn't he? He's been a deputy a long time?-- Yes.

And he's a sensible fellow, he's not a clown down the pit, is he?-- No, he certainly isn't.

And he would behave, in your anticipation, much the way you would in the sense of putting signs of danger or safety things in his report?-- Yes.

And your experience of him and his reports would suggest so, wouldn't it?-- That's correct, yeah.

And you notice from his report that he doesn't have anything about a smell either in his - did you see that?-- Yes.

And that's consistent with what he told you down there?-- Well, it's consistent with what we both saw and smelled.

And each of you have put in under the heading "Other source of danger" - in his case, "None apparent", in your case "None" - is that "discerned", is it? I can't quite -----?-- "Nil detected".

"Nil detected", I'm sorry. That accurately records your view at the time?-- Yes.

There was not a source of danger?-- That's correct.

That, do I assume correctly, is probably what you also

conveyed to Klease? I don't mean precise terms -----?-- Not at this stage, no, but the day before or a couple of shifts before when we had our - yes.

You mean earlier in the day when you were coming on and Klease was going off?-- Yes.

And then when you came up from that you left around, I think, 11.30 and came up to the top which is when you took over in the Unor room?-- Yes.

As you understood it at that time, Mr Mason had been in the Unor room watching the screen like you were about to do?-- Yes.

He told you something about what he had been doing?-- Yes.

Can you tell us about that?-- I can't really recall the conversation we had.

In general terms did he tell you that he had been raising the levels, alarm levels?-- No, he wouldn't have told me that.

Did he tell you that that's what he wanted you to do?-- That's what he wanted me to do. I don't think any alarm levels would have needed changing up until that period.

That may be so. And he wanted you to stay there and to keep an eye on the monitor screen and raise the levels as required?-- That's correct.

You knew that he was going off?-- Yes.

Away from the mine?-- Yes.

So there wouldn't then be an undermanager there?-- That's correct.

But there would be you?-- Yes.

And the other deputies would be down the pit?-- The other deputy.

Sorry, the other deputy. Neil Tuffs had gone home, I think?-- That's correct.

Did he go home early or -----?-- I'm not sure. I just relieved - actually the way it goes, Neil relieved George for a period of time and then I went down and relieved Neil because he had been there for a double shift as well, I think.

It may be that he had gone home straight away?-- I don't know.

Certainly by the time you came to the top there was really only you and George McCrohon left as deputies?-- When I came to the top, no. George had gone as well.

Had he?-- I think.

Who was the other deputy who was down the pit, can you remember?-- Who was the other deputy down the -----

Yeah, when we were talking about it I said the undermanager had gone home, that's George Mason?-- Yes.

There was you with the Unor screen and I said there was two deputies down the pit and you said, "No, one"?-- Cole Klease.

Cole Klease, I'm sorry, because he was the one that relieved you -----?-- Yes.

I beg your pardon. That was my error. I tender those reports as a bundle, reports by Mr Graham.

WARDEN: Admitted and marked Exhibit 145.

ADMITTED AND MARKED "EXHIBIT 145"

MR MORRISON: I want to give them back to you for a moment because I forgot to ask something about that last report. You might remember it anyway. As appears on that report you took a parts reading and a CO2 reading and they were for - to comply with what you understood to be the practice of taking those sort of readings on every shift?-- Yes.

But you don't record a velocity on that occasion?-- No.

Did you notice that?-- Yes, I wasn't aware that a velocity or anything had to be taken.

I was going to ask whether it might have been because the regulator was affected, wouldn't have been all that accurate to have one anyway because of the state of the regulator?-- Well, there would have been a difference to the previous day, I would imagine.

Can I take you back to some other matters for a moment? I want to come back to this general time, but I want to deal with some other things as well if that's all right. You mentioned the problems that you perceived with the layout of the panel. As I understood you correctly yesterday, they were really to do with the development time and the product really of using cut and flit on development?-- Yes.

Because when you use the cut and flit you end up with effectively two crews; one is punching or cutting the bord and the other one is roof bolting where it's just been?-- Yes.

So you in fact end up with a diversion of airflows in order to maintain some air to each crew?-- That's correct.

And of course when you are doing that on development in the bottom part of the panel you are using the bottom return as

you return?-- When you are developing that side, yes.

That wouldn't apply on extraction, as I understood what you said?-- No.

So what you described to us yesterday as problems with the layout is really things that arose on development?-- From what I could perceive, yes.

And on extraction, as we have noted, there was very few times you were actually in there to do things on extraction?-- That's correct.

And as I perceive the reports as we went through them - remember we identified the places you were down in the bottom corner then so far as extraction was concerned, and a significant number of them were non-production shifts even the June one. There wasn't a time so far as we can discern when you were actually a deputy on production behind those big pillars, you know the big compartment pillars that people have been talking about?-- Yeah.

Would that be an accurate comment?-- You will have to ask me the question again.

Sorry. As we saw the reports, the very few production reports and those of actual production, not -----?-- Yes.

----- something else, you were only down in that bottom corner, and then the only time you were further up the panel there was a non-production shift anyway. So you weren't actually running a production shift behind those big compartment pillars at any time?-- Yes, I was. I don't know exactly what dates it would have been.

We can rely on the reports, I take it?-- Yes.

At this mine you were saying yesterday that if people had safety worries they would raise their concerns with appropriate people be it deputies, miners to deputies or deputies to check inspectors or anyone to management?-- Yes, that was the course of events.

And people could do that at safety meetings if they chose?-- Yes.

But there was no need to wait for a safety meeting. If the matter was important you would go to management any time?-- Yes.

Or certainly you did. You were not backward in coming forward if I can put it that way?-- I don't think I was.

If matters concerned you you didn't feel inhibited about going and voicing them?-- No.

Some of the people that you might deal with would be people like George Mason and Albert Schaus from time to time?-- I've never really had any dealings with Albert. I usually talk to

George.

George you knew from long - years back?-- Yes.

He had been at No 4 when that incident happened and you had had something to do with him then?-- Yes.

Would it be reasonable to say that you and he got on with a reasonable degree of responsiveness to one another?-- Yeah.

If you took a matter to George you wouldn't expect it to be ignored or to be rebuffed or anything like that. He would treat you seriously?-- He would treat you seriously, yes, but I don't know about the ignoring and rebuffing part. Sometimes you would be ignored or rebuffed.

It would depend on differences of opinion about what you raised?-- That's correct.

Some of the things you raised would be things people could legitimately have differences of opinion -----?-- Of course.

Others you felt more strongly about and did more about?-- Yes.

On some occasions I think you might have not been satisfied with the response you got from someone - I don't mean George, I mean anyone - and taken it a step further by getting a check inspector brought in?-- Yes.

That's to sort of add a bit of clout to the argument as it were?-- Well, that's the chain of command. That's the way it has to be done.

Check inspectors would be involved in that discussion by you and with management and then one way or the other matters would be resolved?-- Yes.

Did you have much to do with the others in management? Can I ask you about Joe Barraclough, for instance? He was mainly training officer but he did have a stint as acting manager. Did you have much to do with him?-- Yes, on occasions.

And he was not so much in the mould of George Mason but the same sort of thing. He was responsive, would listen to you when you came to talk?-- Extremely.

Both of those gentlemen that I've mentioned, that's Mr Mason and Mr Barraclough, both of those you would describe, I think, as being safety conscious persons?-- Yes.

At the safety meetings, from time to time you mentioned that they didn't have a fixed time but basically the undermanager would say, "We are going to have one."?-- Yes.

Sorry?-- Yes.

I thought I interrupted you. Even though the times weren't fixed the meetings were fairly regular?-- I wouldn't say they

were regular.

Well, once a month there would be something happening of one sort or another, wouldn't there?-- Possibly.

Some of those meetings could go quite a long time, several hours at times?-- I've never been to a seven hour safety meeting.

Several?-- No, I've never been to one of them.

On occasions there have been meetings that have been designed to occur on succeeding days so that all shifts could be covered?-- Yes.

And the same topic would be raised over and over again with each shift?-- Yes.

An example of that might be the method of mining for 512, for instance, how we are going to go about it and what to look out for?-- Yes, I think so, yes.

One of the hard and fast rules about 512, I think, was no-one going beyond the three metre height on ribs?-- Yes.

That was something really that Albert Schaus imposed because of a concern about the men being injured?-- Yes.

Dave Campion had had his leg broken at a stage when the rib height was higher than three, up near five, I think?-- I don't know. I don't know how that occurred.

You are not sure how that came about -----?-- No.

----- that rule, but it certainly was hard and fast?-- Yeah.

Men not to be exposed by going beyond three metre heights?-- That's correct.

Would it be fair to say that others at the mine - I'm talking about other deputies and other miners - were like you, there were plenty of people who weren't inhibited or backward at speaking out about safety matters if they perceived there to be one?-- That's correct.

And in the way of miners, in this mine and no doubt a lot of other mines, that sort of conversation wouldn't necessarily be in nice, restrained, formal tones, but it may consist of the miners standing management on their ear about something?-- It could do, yes.

And it's like a frank exposure?-- Yes.

Now, can I come back then to 6 August, the seal day? You mentioned that you understood that some previous deputy, and it may have been Klease, it may not, had mentioned a benzene smell; that was not from reading any report, that was just your understanding from something someone said?-- Yes.

And you were concerned enough or curious enough - I don't really care which word you want to use - to go down and check it out yourself?-- Yes.

Now, that's something that you would always do, you prefer to check it out yourself?-- Yeah.

Very much trusting your own judgment?-- Well, you can only trust your own judgment.

It would be, I think, your experience that there are inherent problems in relying on what others say because you don't know precisely what they see or what they experience or what the conditions were or precisely what it is they mean by the words?-- That's correct.

And that inherent problem of relying on descriptions leads you, in your experience - and may I say sensible experience - to go and check it out yourself and trust your own judgment?-- Yes.

And were others to do that, I mean to adopt that course, that is to say to go and check things out for themselves, to investigate for themselves and trust their own judgment, that's a reasonable course in your experience?-- Yeah.

That's a reasonable thing to do?-- Yeah.

In fact a sensible thing to do?-- Yeah.

That's exactly what you were doing on that day and you formed your own views based on your own experiences, but taking into account what other people had said on that day you went down there?-- Yes.

That is fairly indicative of the way you would approach the investigation of some incident like that?-- Yeah.

That's normally what would happen?-- Yes.

You wouldn't dismiss from your mind what others had said, you would take into account what they said but go and make your own assessment?-- Yes.

And that again, may I ask you whether you agree or not, if that course was adopted that is a sensible and reasonable course to take?-- I think it is, yeah.

In fact in looking or in investigating these sort of reports really it's an imperative, isn't it, really the most appropriate course is to bear in mind what has been said, go and check it out yourself and make your judgment based upon the actual experiences?-- Yeah.

The opinion you formed when you went down and had a look around yourself, that's right at the start we are talking about, 4.30 when you went down, you went down, quite a number of pillars down - I think No 2 road, was that right, or was it down the return?-- Yeah, down No 2 road or No 3 road. I

can't really quite remember.

And you went down a number of pillars. You were obviously walking down through bottoms there?-- No, no I didn't go down through bottoms. I went to about maybe between 2 and 3 cross-cut.

But the purpose of that walk or that inspection was to do exactly as we have been discussing, that is check it out for yourself?-- Just to go and have a look, yeah, as far as I thought was safe to go, and if I couldn't see anything there I would be quite satisfied.

We have heard your descriptions about what you saw, and I don't want to go over those and all the rest of it, but the opinion you formed was the one reflected - you've still got your statement at page 2 which is consistent with what you've been telling us, and that is your opinion was the situation was stable, it was nothing unusual, it was normal?-- That's what I perceived it to be, yeah.

And to the extent that you conveyed your view to Mr McCrohon and/or to Mr Mason that's the view you would have conveyed?-- Yes.

And that was a view which you had formed taking into account all the things we have been discussing, that is what others have said, your own judgment, your own vision, your own perceptions?-- Yes, that's the view I came across.

You came back up to the surface after that. You had been doing some spare sections, went down, checked it out, came up to the surface. Did you talk to anyone up on the top at that stage that you can recall?-- Not that I can recall, no.

You are sure most men were down the pit including George Mason - I think he was down there with George McCrohon - but there may have been someone on top. You can't recall speaking to anyone up there?-- No, I can't really recall.

Then whatever duties you then did - I'm not greatly interested in them, but you obviously did something and ended up back down the pit to relieve Neil Tuffs?-- Yes.

And you mentioned before - I'm pretty sure it was this morning

in answer to Mr MacSporran - that when you were doing a sealing, that is closing up those entries, you would expect to get a rise in CO because you are cutting off the ventilation?-- Yes.

That's your experience?-- Yes.

So, when you got your reading of 8 to 10 on that second occasion, nothing unusual about that, that is entirely predictable?-- It seemed predictable to me, yes. That's what I had experienced in the past.

And there was nothing during that time down there, including that CO reading, which changed your view from the earlier inspection?-- No.

And at all times to the end of that period down the pit - if we can deal with up to 11.30 at the moment - at all times up to that point your opinion didn't change either?-- That's correct.

Now, can I just ask you - maybe you will need the report back to tell me this, but maybe you can remember - that 8 to 10, can you tell me where you took that?-- In the top return.

Perhaps you could indicate for us - you will have to not only put the red light on it but use the description of what you are showing?-- I would say approximately there.

So -----?-- Around the seal area.

But inbye the seal?-- Inbye the seal, yes.

Inbye the seal in the top return but no further than cross-cut 1?-- No further than there.

Okay. When you came back up having been relieved by Cole Klease at about 11.30, when you came up you spoke to Mason?-- I can remember talking to George, yes.

And can I ask you, as I suspect is pretty obvious, he would have asked you about your view down below?-- Yes, he would have.

And you would have conveyed to him your view as we have been discussing it?-- Yes.

Can I just ask you this: when you stayed then in the monitor room, having got that instruction, did you move straight into position in the monitor room and George Mason moved off doing something else?-- No, I wouldn't have gone straight into the monitoring room. I would have probably had a couple of cigarettes - like, you are not allowed to smoke in those areas - and a cup of coffee, had a sandwich after my shift and then gone into the room.

There weren't sort of other duties you had to go and perform is what I am getting at?-- No.

You took over from him and then went through the procedure as we have heard you describe?-- Yes.

Do I understand correctly that as you observed that screen until you finally left in the morning, there was nothing about what you saw that changed your opinion about the panel?-- No, no, I thought things were going particularly well.

When you finished about 6.30 in the morning, that's the time Cole Klease would have finished too. You would both be ending your shifts at about the same time?-- Yes.

At about the same time when Michael Squires arrived to take over as undermanager?-- He would have arrived on site, yes.

And you can recall having some exchange with him of information about how things had gone?-- Yes.

It would be natural, wouldn't it, for an oncoming undermanager to have exactly that exchange with the outgoing deputies?-- You would think so, yes.

In your experience that's what normally happens?-- Not normally.

Well, certainly when you have got an undermanager there on shift, that undermanager usually waits to hear the reports from the deputies, waits for everyone to get out of the pit?-- Yes, yeah. He may not convey that to the oncoming deputy, though.

No, I understand that. In this case, though, there was that exchange of information?-- Yeah.

And almost certainly as with George Mason, Michael Squires would have asked you, you know, "How did things go? What's your view of what's down there?"?-- Yes, he would have.

In so far as you conveyed any opinion, it would have been consistent with what you are telling us, that everything was normal, it was okay, there was no problem?-- In my view, yes.

Now, understand I am only asking you about your own personal view that you conveyed; I am not asking you to sort of do a retrospective, hindsight, superimposed, hundred variables analysis. I am not asking for any of that sort of nonsense. What I am asking you for is your assessment on the night. Now, would it be reasonable to say then that when you left the mine in the morning you didn't have any concerns about the panel?-- No, I had no concerns.

You considered its performance to be normal and in fact going well, as you said?-- Going well.

You had then at that point no reason, in your judgment, to think that there was a problem?-- No.

No reason, in your judgment, to think that there was a heating?-- No.

And no reason, in your judgment, to think that there was a source of danger?-- No.

And had you thought any of those things, problems, heatings, danger, safety aspects, had you thought any of that, your conduct would have been different, you would have spoken to Squires differently, made some report, raised it with someone?-- Yes, I would have.

Because it would be completely anathema to your conduct and experience and strange over long years to behave other than as you did if you had that state of mind?-- That's correct.

Now, can I ask you then about some general matters, and I want to come back to the Sunday, but I want to talk about something else in the meantime. You were asked some questions about knowing about CO make and things of that nature, and I understood you to say that you had had some training through Mines Rescue about CO make?-- Yes, just in - yeah.

To the extent at least of knowing how to calculate it and in general terms what it was all about?-- Yes.

You understood it was a method of measuring the rise in the production of CO?-- That's correct.

And you understood some general features about it, though perhaps not an enormous amount in detail?-- Yes.

You certainly knew it was a way of assessing CO?-- Yes.

And it was a way of assessing CO that was in use at the mine because they kept putting up graphs about it?-- Yes.

And you knew enough about it to know that in looking at those graphs, what you were looking for was a rapid or sharp rise?-- Yes.

In that respect, the way you were trained to approach CO make was very similar to the way you were trained to approach parts per million, steady increases aren't of particular concern at all but sharp dramatic rises over a short period of time are?-- Yes.

And that's certainly, may I ask, the essence of what was conveyed to you at Mines Rescue?-- Yes.

And you may have even been given to read or had read to you parts of a book by Strang and Mackenzie-Wood; do you recall that?-- Yes.

I will hold it up. I don't know if it means anything to you?-- I've read that.

You have read it?-- Yeah.

In that book what it tells you is that if you reach 10 litres, that's cause to investigate?-- Yes, I don't know if it says that, but if that's what it says, it says it.

"If the carbon monoxide concentration and air quantity from a long" - this is about make - "from a longwall return is known, then greater than 10 litres requires investigation." Can you recall being taught that?-- No.

Not that 10 was anything significant beyond requiring investigation?-- No, I can't recall being taught that.

You certainly don't have any memory of being told at 10 you have got a problem?-- No.

Now, you were asked also by, I think, Mr Clair and Mr MacSporran about the signs, as you understood them, of a heating or a spontaneous combustion incident. You mentioned a number of them: smell, of a particular type, haze, excessive heat and so forth; do you recall that?-- Yes.

And you were asked, you know, if you got a smell, would that cause you concern, and we know what your answer to that is and what your response would be because of what happened on this night?-- Yes.

Can I ask you this: if you got an isolated report of a smell, I mean an isolated one with no repetition even though people go and check it out and are there to see it or, rather, to smell it if it's there and it doesn't get repeated shift after shift after shift after shift for weeks and weeks, would that tend to suggest to you, in your judgment, that if it was there it's gone or under control?-- Yeah.

If you went there yourself, for instance, got a report of a smell, not a smell yourself but someone else said, "I've got this smell.", and you went down and checked it, not just the once but dozens of times, and it was never there, you would form the judgment, wouldn't you, that whatever caused it was either under control or gone?-- Yeah.

And that would be a reasonable judgment, in your experience, to form?-- I don't know if it would be a reasonable judgment, but it would be -----

Well, given what I have just told you, and your reaction was, "Yes, of course, I would form that view."?-- Yes, it would be a view, not a judgment.

A reasonable view to hold, not necessarily the only one, but a reasonable one?-- A reasonable one, yeah.

And, in your experience, you would say that is a reasonable view to hold?-- Yes.

So that the significance of a smell has various variables to it, as would all of those signs. You have to take into account a lot of things, don't you?-- Yes.

One of the things you might take into account is who smelt it?-- Yes.

If it was some fellow who really didn't have an experience in smells of the description he is giving, that's a relevant factor to weigh. You don't dismiss it necessarily, but you weigh it?-- That's correct.

Likewise, if it's not repeated, that's something to weigh. There are a lot of things to take into account, aren't there?-- Yes.

And you don't just react on the bare fact of the smell, more is needed?-- That's correct.

Likewise, the haze, same thing. Variables there would include whether it was diesel, whether it was caused by some sort of machine, whether it was momentary, whether in reality it was very fine dust. Those sort of things would all play a part in how you assess the impact of it?-- Yes.

So, you wouldn't, for instance, necessarily link a haze to a smell; they might be produced by different things?-- They could be.

That's all part of the assessment process that one has to make, isn't it?-- I think so, yes.

I mean, you have to - it all demonstrates, if I may ask, what would be the necessity for doing what you did, for going down and personally checking it out. That's really the best thing to do?-- Yeah.

Now, when you were down that night and you couldn't find the haze - you had a good look around and couldn't find the haze, you must have thought to yourself, "Well, it's diesel."?-- I beg your pardon?

You must have thought to yourself, "It's produced by the machines."?-- Yes, that was my views and my thoughts, yes.

And nothing that you saw or what anyone said to you caused you to change that opinion?-- No.

Now, in so far as you were told about CO make at Mines Rescue - and that's from Mr Kerr teaching you, I think you said - you mentioned yesterday when you were asked what would you look for if you were looking at that graph or you were looking at CO make, and the words you used were you would look for a consistency or inconsistency?-- I would.

You are really describing the trends rather than spot figures, aren't you?-- Yes.

So, a spot figure doesn't really tell you very much?-- No, it doesn't tell you anything.

And it would be dangerous to rely on a spot figure, whether it's parts or make?-- Yes, it would be.

What one needs to do is make an assessment of an overall trend?-- Yes.

Now, can I come back, if I may, to the Sunday when you came back? You came back in the evening about 10.15, I think, usual start time for a night shift on a Sunday night?-- Yes.

You said that you went straight away and got changed into your work clothes?-- Mmm.

Then went around from there to read the deputies' reports?-- Yes.

And you didn't read them all because basically what you were interested in doing was reading the one for the area you were going to go to?-- Yes.

And they were the first two things you did, get changed, go around, read the report?-- Yes.

And you would have done that before speaking to probably just about anybody?-- Yes.

And they are two things that you would do normally if you were arriving at the mine in order to go down and work?-- Yeah.

And those two things are routine?-- Yes.

If you are arriving knowing you are going to work in 1 North-west, you get there, get changed, go around and read the report for 1 North-west?-- That's correct.

Now, you spoke to Michael Squires at some point in that period at work, and I think you said Michael Squires was merely giving you information about who was going where?-- That's it.

"You fellas over there, you fellas over there.", and I think he may have told you you would have an extra man or particular bloke on your shift?-- We were short on shift and there would be an overtime man coming in at 11 o'clock.

And he would be designated to you?-- Yes.

The result of the shortages was that you would only be able to run one shuttle car?-- That's correct.

Which is less than usual obviously. Normally you would have two running on the wheels from the miner to the boot?-- Yes.

So, non-appearance of staff or staff shortages - I am talking about miners not showing up or not wanting to be rostered on or for whatever reason not turning up - meant that decisions had to be made about, firstly, who would go where and, secondly, how many men you would have to operate your particular section?-- That's right.

And in your case it had a limiting effect, you couldn't

operate as efficiently as you normally would because men didn't show up?-- Yes. Not only men didn't show up but deputies didn't show up as well, so we were short of deputies.

I didn't mean to draw a distinction between those two, but that's right. In fact, Michael Squires, I think, might have said to you that he had arranged for Ken Guest to come in?-- That's right.

But he wouldn't be there till about 1 o'clock or thereabouts?-- That's correct.

Because he had a distance to drive?-- Mmm.

Now, Squires didn't ask anything or tell you anything about 512?-- No.

You and he had spoken that morning anyway about it when you came out of the pit?-- Yes.

So, he knew your view about it already from that time at least?-- Yeah.

Now, you at some point, either before or after speaking to him, went to look at the monitor?-- I didn't go to look at it, I just read it as I walked past.

I'm sorry, I didn't mean to suggest you made a specific trip, but you certainly did look at it?-- I did look at it to see what the readings were in the 512 section.

You mention them in the report?-- Yes.

I take it when you were doing - not the report -----?-- The statement.

The statement. I take it when you were doing the statement no-one showed you what the actual readings from the Maihak log were?-- No.

So, this was doing your best at that time without the benefit of any documents that recorded the truth?-- Yes.

And nothing you saw caused you to change your view about your perception of 512?-- No.

You, as you have told us, were in a position where you knew from experience and very recent experience, the night before, what the monitor screen looks like, what alarms look like and how to cope with them and everything else; you were pretty familiar even from recent experience with that?-- Yes.

So, you wouldn't have had too much doubts about how to analyse or how to assess what you saw on the screen?-- No.

And your view that night did not alter from what it was the night before?-- It did alter slightly. I didn't vent my views to anybody in particular, but I didn't think we should be going down the mine to work that evening, no, but I didn't

make that view known to anybody.

But it wasn't a strongly held view?-- I don't know.

Well, I am not meaning by other people because you did go down?-- Yes, I did go down because I didn't want to have an argument with the undermanager, and I knew that's that would happen.

We know what your attitudes to safety are, and they are obvious ones, you don't personally endanger yourself and you don't endanger anyone else, do you?-- No.

And if you had had any thought that there was a danger, you wouldn't have gone down; that's true, isn't it?-- That's true.

And if you had thought there was a danger, not only would you have gone down, you would have taken steps not to tell everyone else to go down?-- Yes.

You would have raised it with management, and if you thought there was a danger, as you have done in the past with other matters, if necessary, you would have gone the step further and got the check inspectors involved, if necessary, in order to ensure your view was properly treated?-- Yes.

And knowing that about you and knowing those views, it's entirely consistent with your thought that there was no danger that you went down?-- Yes.

You wouldn't have gone down if you had any other thought, would you?-- No, I would not have, no. I didn't think there was any danger.

No, no. But then, when you arrived, you did all those things which were routine things for going down: got dressed, went and read the reports for your section you thought you were going to?-- Yes.

There is no question, though, if you had had the slightest thought that there was a real danger or any perception of danger, things would have been different?-- That's correct.

And that perception or that view of yours is, as we have discussed, one which is made knowing all the things you knew and had seen and experienced in the sealing and what you had seen and experienced on Sunday night?-- Yes.

Taking all that into account?-- Yes.

Now, you mentioned yesterday that you had had discussions, arguments - call them what you will - with management about men going down after a seal had been put on?-- Yes.

And you had really sort of put them in two categories or perhaps two descriptions of the same thing; it almost certainly wasn't at safety meetings or pit-top meetings, but more likely in one to one or one to two discussions?-- Yes, just in general discussions.

I take it from what you say that you wouldn't have had that sort of discussion with Mr Schaus, with whom you had not very much to deal with?-- No.

And more than likely you didn't have that sort of argument with George Mason?-- Yeah, quite possibly it would have been with George Mason.

You have no memory of it, though, do you?-- No.

And even more unlikely with Joe Barraclough?-- Definitely not Joe Barraclough.

And Jacques Abrahamse, even more unlikely still?-- Mmm.

I take it from what you were saying yesterday that you held that view fairly strongly?-- Mmm, yes.

And from what you say and given your past experience, it is something that you would have raised with check inspectors from time to time?-- I would have talked to them about it, yes. Not officially, of course.

I understand. I am not trying to make a distinction between a formal report or something like that, but it is an issue that you raised with the check inspectors; they knew your views?-- I would say they would have, whether I - yes, they would have.

And some of those check inspectors were also - had positions of official natures with the unions?-- I would have only talked to one check inspector about anything - the only one I would have talked to would be Steve Bryon.

Okay. There were miners there who had official positions in the union - George Zeibell is one?-- Yes.

And then there were the check inspectors themselves who are there for the purpose of the union monitoring safety issues for the men; isn't that right?-- Yep.

And would it be right to say that your views would have been known by the check inspectors, certainly Steve Bryon, and possibly known by other miners like George Zeibell?-- I don't know. I can't say what they believe or what they knew.

No, your views as conveyed by you?-- I talked to them about it, yeah. Whether they-----

That's all I'm asking - whether you conveyed your views to them?-- Oh, right.

And did you? Am I right?-- Yes.

So, you would have also told them - that is, the check inspector, Steve Bryon, and possibly others - the basis of your views - why it was you had that view?-- Yeah.

Did you seek to get the union involved in arguing that case for you?-- No.

It is the fact, isn't it, that the union didn't go and argue that case for you?-- No, they wouldn't have argued the case for me. Like I said before, it wasn't anything I would have brought up on that level.

But nonetheless, the union did know about your views-----?-- I'd say-----

-----through the check inspectors?-- I'd say they would.

And yet they didn't go and raise that with management. Do you find that surprising?-- I don't know whether they have or they haven't.

If they didn't, would you find that surprising? Is it of concern to you that they wouldn't do that, or is it really not something-----?-- I would be concerned if they hadn't, but management probably knew my views anyway.

But I'm concentrating on the union's response. As you understand it, the union people knew your views about this matter we have been discussing?-- They would have been aware of my views, yes.

And the basis for them?-- I don't know.

Well, you expressed the basis, at least, to Steve Bryon, you told me?-- Yeah.

And you have no reason to think - nothing that tells you that, in fact, the union did anything about that?-- I wouldn't know.

You don't have any reason to think that they did, do you?-- I don't have any reason to think they didn't, either.

I have nothing further, thank you, Your Worship.

CROSS-EXAMINATION:

MR HARRISON: Mr Graham, in the years leading up to the explosion at Moura, you weren't a regular member of one of Michael Squires' production crews, were you?-- I beg your pardon?

You weren't a regular member of the crews that Michael used to work with most frequently?-- Yes, I was.

Were you?-- Yes, I was.

Was it the case right up until the end?-- No, I had changed shifts.

And was that, in fact, some years before the incident that you changed shifts?-- No.

When was it?-- I can't exactly recall, but it was during that year.

Now-----?-- Or if not, early in the year - within six months, yeah.

Now, for that period, say be it six months or whatever it was, you would have only fairly limited contact with Michael; would that be right?-- Yes.

You might run into him when he might have been filling in for someone else?-- Yes.

Or vice versa; when you might have been filling in for someone else?-- Yes.

Would that be right?-- Yep.

Or you might have some contact with him, say at weekends when you were both rostered on at certain weekends?-- Yes.

But certainly in that last six months or so, or whatever that period was, the contact wasn't all that great?-- No, that's correct.

Would you say that Michael and you are two totally different personalities?-- Yeah.

To use the vernacular, the two of you were like cheese and chalk; would that be a fair comment?-- Yes, in my views we are.

Have you heard the phrase used in relation to two different people, a "personality clash"; ever heard that used?-- What, the phrase?

Yes?-- Yes, sorry.

A personality clash between so and so and so and so?-- Yes, I have.

Would you say that that was the case between you and Michael?-- Yes.

You never really got on?-- No.

You would clash over things that were relatively insignificant, from time to time; would that be a fair comment?-- I don't say they would be insignificant.

Certainly when you look back on them later, insignificant?-- I can't really remember what we clashed about, to be quite honest.

Was it the case with you and Michael that there would often be an occasional snap as between one and the other, that things would cool down and then get back to normal?-- Not often.

See, it wasn't the case that you fought all the time?-- No.

Or argued all the time you saw each other?-- No.

But there would be the odd clash from time to time?-- If I thought his views were wrong or I wanted to vent an opinion, I would do so.

Now, certainly in that six months or whatever it was that you hadn't been working regularly with him, there hadn't been too many problems in that time, had there?-- No.

Any more serious clashes you had had had been some time earlier than that?-- Yes.

Michael had reprimanded you on occasions in the course of your work, hadn't he?-- Yes.

And did he reprimand you on a couple of occasions in situations where he found you lying down, down in the pit?-- I wouldn't say so, no.

That was what he said, wasn't it?-- That's up to him what he said.

He reprimanded you on occasions about that?-- No.

Did he discuss that with you; in other words, allegations to the effect that you had been lying down down in the mine without a helmet on?-- No.

Did he discuss anything like that with you on occasions?-- On occasions he would have, yes.

He would have said, "I don't want to find anyone laying around tonight.", or something of that nature, or "this afternoon"?-- No.

Weren't there, in fact, occasions where he actually claimed to have found you in that situation?-- I don't know.

Pulled you to one side, I suggest, and said to you, "Look, that's not the sort of example you should set for the men underground."?-- No.

In any event, did you bear any resentment to Michael for anything he may have said to you by way of reprimand?-- I didn't bear any resentment to the man at all. It was a work-related thing. If we met socially, we would be quite hospitable towards each other, I would imagine.

There would be those occasions from time to time where you might clash?-- Yes, there would be.

Occasions which you would relate to perhaps personality differences between the two of you?-- Not personality differences, no. Work-related differences, differences of opinion.

You said yesterday that you had been suspended on a couple of occasions in the past; do you recall that?-- Yes.

Now, were you referring there in part to one incident where Michael actually stood you down without pay on a dogwatch shift one night?-- That's correct.

That was after you had said certain things to him, wasn't it?-- Quite possibly.

In fact, if I can phrase it the way you did before - after you spoke to him - in terms which you said weren't strong by mining terms, but in terms that you wouldn't repeat here?-- Quite possibly.

You swore at him?-- Quite possibly.

And he stood you down on that occasion, did he not?-- Yes, he did.

And wasn't it the case that the whole thing was resolved fairly quickly in the sense that a union delegate became involved, discussions were held and it was resolved pretty quickly in the same shift?-- Yes, I was sent home. I was stood down, so I went home. I was called up by the union representative, told to come back to work, and Mr Squires then apologised.

It was all resolved fairly quickly, wasn't it?-- Yes, it was.

And that didn't involve any argument stemming from men being in the mine underground after a panel had been sealed, did it?-- No.

It was something that happened in the normal course-----?-- It would be something else, yes.

-----of production. In fact, you are not in a position to relate any clash you have had with Michael which involved men being in the mine underground at a time when a sealed section was going through the explosive range?-- I can't recall having a clash with Michael Squires over that, no.

Thank you, I have nothing further, Your Worship.

MR CLAIR: Your Worship, I just have some questions before the panel asks any questions.

WARDEN: Yes, thank you.

RE-EXAMINATION:

MR CLAIR: Mr Graham, you have agreed that you are a very experienced miner?-- Yes.

Is that right? And, in fact, you were one of those who would have had some influence over the other miners because of that experience?-- Quite possibly, yes.

Well, did you notice that in your-----?-- Yes.

-----day-to-day operations they listened to what you had to say?-- I found it very easy to work with the men - they were very responsive.

Have you, over time, become familiar with what might be called the "culture of mining"; that is, the attitudes that might be adopted generally by miners?-- I don't know what you-----

Attitudes to their work, attitudes to safety, that sort of thing? Would you regard yourself as being familiar with general attitudes adopted by miners to the way they carry out their work, to safety, to the way they relate to one another?-- Yes.

In terms of safety, you have certainly said that each miner is regarded as his own safety officer; is that so?-- That's correct.

But, of course, the fact that each miner is his own safety officer wouldn't alleviate people at a higher level, either deputies or management, from having concern for the safety of the men; is that right?-- That's right.

And, of course, one other aspect of this feature that miners are their own safety officers is that they must be kept fully informed of all the circumstances so that they can make their own decisions; is that so?-- Yes.

That applies to miners, it applies to deputies; is that so?-- Yes.

Of course, in terms of decisions that have to be made by management, it is important that management be kept fully informed, too, of what the situation is?-- Oh, yes.

And systems should be in place for management to remain informed; is that so?-- Yes, we should all work as a whole.

Another aspect of this - what I'll call the culture of the mining community - then would be the attitudes that the miners might have in terms of their relationships with one another. Let me ask you this: if there was some concern that a miner had about safety, but it was not a serious concern, would you think that there might be some reluctance for a miner to mention that concern because he didn't want to appear to be perhaps a bit of a coward or a bit of a whimp, being worried about something which shouldn't or may not really be regarded as serious?-- Yeah, I would say you could draw that conclusion.

Have you experienced that sort of thing yourself?-- Yes, I have.

But, on the other hand, I think you have agreed that you're a person who would speak out if you had any concerns?-- If I had any concerns at all.

Would there be other people who mightn't be so ready to speak out?-- I don't know.

Well, in your judgment, are you a person who is more ready to speak out than others about safety issues?-- I don't think so.

You think you're pretty much the same as anybody else? Okay. You spoke about the situation on the Sunday night when you came on duty. You said, at least in your evidence in chief, I

think in answer to some other questions, that you had some concerns about the situation with 512 panel, but you didn't voice them; is that right?-- Not in an official context no, but we talked verbally amongst each other on the surface.

I think later you said in answer to Mr Morrison that really you didn't have any concerns about 512 - about the safety of the 512 panel at that time?-- No, no undue concern.

No undue concerns?-- No.

I'm just trying to reconcile the two things that you have said. On one occasion you said you had some little concerns about it-----?-- I had concerns-----

-----but you didn't raise them, but on another occasion you said you didn't really have any concerns about the safety; your attitude was the same as it was on the Sunday morning. I am trying to ascertain what the real situation was. Did you have any concerns or didn't you?-- On the?

Sunday night?-- No.

You also said that you didn't feel the men should be going underground on that night?-- I never felt that we should ever go underground when a panel had been sealed.

So, that view was really one that arose out of your belief-----?-- That was my personal view.

The best course on any occasion was not to go underground?-- Yes, that was my only personal view.

While the panel was going through the explosive range?-- While the panel was going through its inertisation stage. They don't all necessarily go through an explosive range.

Yes, okay. Now, you also spoke of when you came on duty on the Saturday afternoon, and I think you said you did have some conversation then with Mr Klease; is that right?-- It wouldn't have been a conversation, it was just a passing of words as we passed in the corridor or during the changing times or on the quadrangle where we all accumulate for the start of shift.

Do you remember the topic of that conversation?-- Yes, I do.

What was that?-- That was - I wondered what all the fuss was about, pack of whimps going down to - "what are we sealing the place for so quickly?" I could see no rush and there were other duties that I thought should have been done on that weekend.

Did you say that when you first saw him?-- Yes, I think so.

At that stage what did you know about the reason for sealing?-- None.

You knew nothing?-- I had heard that it was a possible heating.

And you don't know where you heard that from?-- No, I just heard it in general conversation.

Now, you describe what you said to Mr Klease, but in fact you said earlier in your evidence that whatever you said to Mr Klease was in terms that you wouldn't want to use here?-- That's correct.

So whatever you said to him was, what, fairly scathing, was it, about the notion that there should be a rushed sealing, that any sealing of the panel should be brought forward and done as a matter of urgency?-- I beg your pardon?

I say what you said to him was fairly scathing, that is you expressed some scathing views about this suggestion that the sealing of the panel should be brought forward and done as a matter of urgency?-- I still don't -----

Does that sum it up? Do you know what I mean by scathing?-- No, that's what I'm trying to say to you.

To put it in the vernacular, you rubbished him a bit about any concerns that he might have had that the thing should be sealed urgently?-- Yes, I did.

You gave him a bit of a hard time?-- I don't know whether I gave him a hard time. He's a big man.

In your evidence you've said that he seemed to be a bit put out with you because you had spoken to him in that way; is that right?-- Yes.

Well, isn't that consistent with his at least feeling you had given him a hard time?-- No, he was that sort of person anyway.

When you say "that sort of person", he was a person who tended to be a bit more easily concerned about these sorts of issues, the safety issues?-- I can't make a view on that, no. I can only go -----

What did you mean when you said he was that sort of person?-- Very hot tempered, quick off the mark, grumpy.

And you, were you hot tempered?-- Sometimes, yeah.

You are quite sure that conversation occurred when you saw Mr Klease at that stage and not later when he came on to relieve you down at the sealing of 512 some time -----?-- The conversation probably took place at both stages, yes, but all I can remember about that situation at 11.30 was I was sitting at the crib table trying to talk to Mr Klease as he was rushing past.

He said that on that change-over you asked him why there had been the panic to erect the seals?-- Mmm.

And you went on to say that you hadn't detected any haze and that you said that the CO readings were a bit lower than the readings that he had recorded?-- Yes.

Does that accord with your memory at least of the general thrust of the conversation -----?-- The general -----

Can you wait until I've finished because this lady has at that take it all down, you see?-- I thought you had.

Does that accord with your memory of the general thrust of the conversation at that time?-- Yes.

Now, you did say to Mr Morrison, to be fair, in answer to questions that he put to you, that really if there was any suggestion that there was something wrong in a panel, for instance, a suspected heating, that the best thing to do was to go down there and have a look at it yourself?-- Mmm.

Is that right?-- Yes.

And you hold by that?-- Yes.

You wouldn't think, for instance, that you should make some further investigations as to what other people have seen or what other readings have been taken recently in the panel or what other smells may have been detected in the panel in recent shifts?-- No, there was no other way of determining that factor.

No, I don't think you really are addressing my question there. I said you wouldn't think that it might be preferable, or at least desirable, to make some further investigations about

what other people had seen or smelled or what readings had been recorded in the panel during recent shifts. Would you regard that as being a useful additive to going down there and having a look yourself?-- Yes, I would.

Is it true then to say that the best way to find out what is going on is to go down and have a look yourself?-- Yes.

Well, isn't the best way to find out what's going on first of all to find out what other people have seen or smelled, what readings have been taken and then you might know what to go and look for; isn't that so?-- That could be conceived like that, yes.

Well, when you went down to have a look yourself what did you know at that point about what had been seen or smelled or what readings had been recorded in the panel over recent shifts?-- I had no recollection or no idea what readings had been taken in the panel over the previous shifts and all I had heard was that some fellows and Mr Klease had spotted a haze and had smelled the benzene type odour in the return.

You see, when you went down then you weren't aware of the fact that on the Friday afternoon there had been a strong tar smell at number 10 cross-cut?-- I was not aware of that.

Or that there had been a reading of 10 ppm of CO at 10 cross-cut?-- I wasn't aware of that.

In through the hole in the stopping?-- Wasn't aware of that.

Did you think that it would be wise to take some steps to find out about those things before you suggested that the panel was being sealed in a panic and an unjustifiable panic?-- Can you run that one past me again?

Did you think it might be wise to ascertain what had been going on in the panel over recent shifts and at least find out about those sorts of things that I've just drawn to your attention before you suggested that the panel was being sealed in some sort of unjustifiable panic?-- No, I wouldn't have gone to those steps because those figures would not have been available to me.

Well, they would have been available to you if you had looked at the deputy's report which had been readily available to you when you commenced your shift, Mr Caddell's report from the previous afternoon. Could the witness see Exhibit 81, please, Your Worship? You will see that that's the deputy's report from the Friday afternoon shift?-- Yes.

You will see in the first inspection there was 8 ppm at the monitor point, 10 ppm CO at number 10 cross-cut, and down there in the general comments a comment which includes the assertion that a strong tar smell was evident at 10 cross-cut?-- That's what it says.

Now, I mean, these sorts of -----?-- I haven't read that report.

Sorry?-- I haven't read this report before.

I know. You see, this is one of the features of the system that was in place, but it's also relevant to any conclusion that you might have been justified in drawing on the Saturday afternoon or the Saturday evening, that there was some unjustifiable panic about the sealing. You see, these comments are put in these reports so that people can read them and see what's going on in the panel; isn't that so?-- That's correct, yes.

But - and I think we establish this in your evidence-in-chief - there is no system in place whereby a deputy on a later shift actually looks back and finds out by reading a number of reports what has been going on in the panel; is that right?-- From time to time you would probably - you would definitely flick back through the reports, but - if it was pertaining to your panel, yes, but this wasn't pertaining to my panel.

No, it wasn't, but you were interested enough -----?-- Yes.

----- to go down to the panel to find out for yourself what was going on?-- Yes, I had vented interests, yes.

What I've suggested to you is that if you really wanted to know what was going on you wouldn't just go down to the panel, you would seek to inform yourself about what other things had been observed or smelled or recorded in the panel over recent shifts. You've agreed with that?-- Yeah, I agree with that, but I didn't.

And there it was in a production deputy's report which would have been two behind - or one behind the one that you read - sorry, two behind the one that you read when you came in on the Saturday?-- I didn't read this report when I came in on Saturday.

No, I know that?-- It wasn't my section.

I see. Well, it wasn't your section. You didn't go to the 512 book at all?-- No. I had four other sections to look at that night.

When you spoke with Mr Klease and asked him why it was that the panel was being - why there was the panic is perhaps the best way to put it, in whatever terms you put it to him, but when you asked him why there was the panic about the sealing did you give him any opportunity to tell you what he had observed -----?-- Yes, I think -----

----- during his shift?-- I would have, yes.

What did he tell you that he had observed?-- Him and some other miners had observed a haze and a strong benzene odour.

Did he tell you where that was?-- No.

Did you ask him where it was?-- No.

Were you interested in finding out -----?-- Well, I knew it would be -----

----- the details of what had been going on in the panel before you suggested that it was being sealed in a panic?-- No.

Why not?-- I really don't know.

I think you've agreed you gave him a bit of a hard time?-- I didn't give him a hard time.

You agreed earlier that it had the effect on him of making him angry about your suggestion that there was some unjustifiable panic?-- I don't think I was the only man who said that to the man.

You think there might have been others too?-- I think there was.

Well, of course, within the mining culture that sort of response from a fellow miner, particularly a respected, experienced deputy might well have the effect of hosing down any sense of panic, might it not?-- Yes, quite possibly, yes.

And would you agree that in these circumstances that we now know by virtue of hindsight, that there was very likely a good reason for the panel to be sealed, as it were, in a panic?-- There would have been a good reason, yeah.

Because all the indications are that there was a heating going on in the panel?-- I was not aware of those indications.

I am saying in retrospect. In retrospect -----?-- In retrospect, definitely.

All the indications were that there was a heating in the panel?-- You've got no idea what's in retrospect, mate, I'm telling you.

Just listen to my questions. In retrospect there is every indication there was a heating in the panel?-- Yes.

And that it was that heating that provided the source of ignition the next night; isn't that so?-- I don't know.

Okay, I'm just suggesting to you that there is every indication that was the case?-- Don't know. That's what we are here for, isn't it?

That's true. Now, when you spoke to Mr Mason did you express any views along the same lines to him that the panel was being sealed in a panic?-- I can't -----

Unjustifiable panic?-- I can't recall saying those things to him, but I possibly could have.

Mr Squires? Did you say anything to him along the same

lines?-- Quite possibly.

And your opinion would be one that would be valued by Mr Mason and Mr Squires; is that so?-- I don't know. Everyone makes up their own opinion.

Coming back perhaps, and I'm not, as it were, trying to be critical of you for holding a view, but what we are here to determine is whether the situation and the systems that were in existence are the best, or if they weren't, what recommendations might be made to change them. Coming back to the situation as it was on the Saturday afternoon when you went in there and the panel was being sealed and you, it seems, without any even moderate attempt at investigation of what had happened up to that point, but on the basis of your own inspection at that point formed a view that there was no justification for the panic?-- There was no justification for the panic, that was my view, yes.

And you formed that view just on having a look at the place, but not on any research or thorough investigation of what had occurred before that?-- No, that's correct.

Coming to that situation then, what would you say yourself about changes that might be made to ensure that there is proper communication of all of the relevant facts to deputies like yourself, to the miners so that they might be aware, or even to the management? You are an experienced miner. What suggestions would you be making about ways to improve methods of communication in those circumstances?-- Personal communication between people, everyone just sit down at the one spot and everybody have an input, not just certain people.

And on an ongoing basis how would you suggest that that can be organised?-- I can't - I really don't know. I would say you should probably have - in my views we should have a 10 minute question and answer time before the start of shift where miners, management and deputies are all together where you can ask questions, find out what has been going on on the previous shift and mistakes would be minimised.

What about the extent of knowledge of deputies, for instance, on the spontaneous combustion question? What would you say about that?-- Well, I think we should all be trained in those aspects.

It seems from what you've said that you really didn't have any great depth of knowledge about the ways to determine whether there was a spon com problem in the panel?-- No.

Do you agree with that?-- I agree with that.

I guess it's fair to suggest that the miners would have even less?-- Yes.

Far less knowledge in many cases -----?-- Far less.

----- than what you would have?-- Mmm.

What do you suggest should be done in those circumstances? A better system of training?-- Rigorous training on all these aspects and not just certain people.

Thank you, witness. Thank you, Your Worship.

EXAMINATION:

MR PARKIN: Mr Graham, I've just got a few questions. Could we return to the pillars in 512, and you stated, and it's been discussed a few times, about stoppings and dead ventilation, particularly during development stage. Could you explain that in a bit more detail as to why you had a major problem in ventilating the panel?-- The whole mine had an air problem, ventilation problem. If you wanted to mine in one section you had to steal air from another section to mine in and that was -----

To steal air from another section?-- You would take air from one place and move it to another place.

What did it do to the place you took the air from?-- It would reduce the airflow in there.

Would that cause a problem?-- Not necessarily, no.

Well, during the ventilation stage were you - you said you had some problems with the ventilation?-- Yes.

In your mind was the panel ventilated adequately?-- Yes, it was adequately ventilated. There were just stale dead areas around the corners of those pillars where the air split in a V formation.

So basically the panel was ventilated satisfactorily?-- Yes.

You talk about the layout of the panel. From a geotechnical or a support point of view how do you rate the panel in terms of safety of operation?-- I have to pass on that question.

Well, you were only a development deputy mainly, weren't you?-- Mmm.

On the Saturday afternoon you detected 8 to 10 ppm in the top return of 512; did you know that that 8 to 10 ppm represented between 17 and 21 lpm of carbon monoxide?-- No, I wasn't aware of that.

And nobody had ever told you anything about that?-- No.

And, of course, this amount of CO, along with a faint odour - and I think we have had some lengthy debate about the odour in terms of whether it was musty or fire stink or whatever - what would that suggest to you if you had have known?-- That would have suggested I should make some further investigation.

But because you didn't know anything about the -----?-- It seemed normal to me.

Had anyone previously told you about parts per million in that top return and what it meant?-- I had read it on the reports but -----

No, but I mean had anyone in management ever explained to you what it meant, the 8 to 10 ppm - I mean, what you were reading?-- No. It was 8 to 10 ppm CO.

This regulator that we spoke of and you spoke of, you said that it had been breached for vehicle access?-- I imagine for vehicle access.

Did you know about that problem prior to starting the shift?-- No.

But at least you did the right thing and reported that at the end of your shift, that you had made some repair to it?-- Yes.

If we can return to the Sunday night. Could you just repeat the discussions that you had with Michael Squires?-- On the Sunday evening?

Yes?-- Before starting work?

Before starting work?-- I don't think I really had any discussion with the undermanager at all; he had discussions with me. I would have asked him where I was going for the shift and who - which miners I was having, and that would have been about all.

I mean, did he tell you anything? Did he inform you of anything?-- No.

I mean, did he tell you that the panel was about to go through the explosive range?-- No.

And that there was possibly some - between 15 and 20 lpm of CO?-- No.

So, you had no communications in terms of what was happening in that panel from the undermanager on that shift?-- No.

Now, following along the lines of the questioning of Mr Harrison, what I want to ask you is this: it's obvious that there appeared to be some problems between you and Michael Squires of a nature that extended back several months; is that correct?-- Several years.

But, of course, we can all have differences of opinion, but we are there to do a job?-- That's correct.

Now, you never let that difference of opinion stand in the way of doing your job?-- No, and he wouldn't have let it stand in the way of doing his job either.

You have made statements about this individual being arrogant?-- That's my personal view, yes.

No, but the question I want to ask you now is: as a deputy, was he arrogant in the fact that when you spoke to him about your duties in the mine - and your duties are about the safety, health and welfare of the people that are employed there - did you have reasonable, sensible discussions?-- Yes, most of the time, yes.

Was he arrogant in that way?-- No.

How often did you attend safety meetings?-- Oh, gosh, off the top of my head I couldn't say, but when a safety meeting was on I would usually be at it. If I was at work I would be at a safety meeting.

Think about this. I would like you to think about this, please. Would it be once a month or once every two months or -----?-- Over the past - the previous 12 months safety meetings were becoming a more and more regular thing, but I couldn't put a time period on it, not at all.

The other question I have is that the panel 512, how do you regard - I mean, were there any accidents there in the panel itself that you know of?-- I think a fella got his leg broken, I think.

Were there any other accidents at all?-- Not that I know of.

Were those accidents communicated to you?-- No.

So, it was never explained to you how the accident happened or what happened, why it happened or what you were going to do to prevent a recurrence?-- Not to me personally, no.

Thank you.

EXAMINATION:

MR NEILSON: Mr Graham, you were asked a question by Mr Morrison in relation to a discussion that you had with Steve Bryon, one of the Union check inspectors?-- Yes.

Can you enlighten me on what that discussion was?-- Which discussion?

That's what I am trying to find out?-- We would have talked about many things to do with mining procedures throughout my years of being there. Steve and I were good mates.

I took it that you were indicating that you had raised issues with Mr Bryon -----?-- Not about going underground when panels were being sealed.

So, you had no discussion with Mr Bryon about this particular event?-- Oh, not about this event, no.

I was a bit confused, that's all, as to whether you were talking about this event or not?-- No, generally.

You have already indicated that whilst you do know how to calculate the carbon monoxide make, you really don't know at what level dangers may occur?-- No.

You are in fact used to the old parts per million system?-- Yes.

Well, can I ask you then to advise the Inquiry as to what level of parts per million or what reading would have caused you enough concern to warrant men not going down the mine, or for you to make a decision?-- During the sealing process?

At any time during the sealing process, yes?-- 50 parts.

Can you tell me why you would say 50 parts?-- That's the MAC value.

If I was to suggest to you that through scientific evidence, which can be established at some other later date, that a reading of 20 lpm is considered by some scientific people to be in the danger zone, would you accept that?-- Yes.

20 lpm?-- I would accept that.

Are you aware that at a certain level of quantity of air flow and a reading of 10 ppm you can have 20 lpm?-- I'm aware that that's possible, yeah, but I have got no idea what the air flow was. I didn't have instruments to test for that.

Were you aware that on, I think, two shifts before you went down the mine on that evening that there was a reading taken and reported in the deputies' report book that indicated a level of 21 lpm?-- No, I was not aware of that.

Had you known that, what would you have done? What would your reaction have been?-- I would have asked questions to the relevant people.

Were you aware of what the reading actually was?-- Which reading?

Would you have known that there was a reading taken of 10 ppm and a velocity reading of 1.6?-- No, I wasn't aware of that being taken. I didn't take it.

So, you didn't look in that report book?-- Before that shift?

Yes?-- No.

I think you have been asked this question before, but I will just ask it again: was it a common practice among the deputies for them to go back through the record book to see what had happened in their panels on previous shifts?-- Yes, I'd say it would be.

But 512 wasn't the panel that you were going to that evening?-- No.

So, you wouldn't have necessarily looked at that?-- No, that's correct.

But if you had a concern - I mean, you were going down the mine?-- Mmm.

And if you had a concern that there could be something happening in a panel that you may not be going to, would you necessarily go to the report book for that panel?-- If I was - yes, I would do.

I am asking you: did you in fact do that?-- No, I did not go to the report book of the 512 Panel.

But there must have been some element of concern in your mind about the events given that even though you had been down there and not smelt the same smell that a previous deputy had - I mean, did that alleviate all of your concerns, or would there still have been an element of concern in your mind?-- No, I wasn't really concerned at all. I was quite happy with the way things were progressing.

Had you not gone down the mine to check yourself to see whether or not there was a benzene smell and had you accepted that yes, there was a benzene smell in that section, would you have had a different view?-- Yes, I certainly would have.

Can you tell me what the procedure you went through was before you went down the mine to check yourself? For example, did you check the barometric pressure?-- I read the reports of the sections that were relevant to me for that shift, I took the barometer readings, temperature, read the Unor, serviced the Rover and went down the mine.

When you read the barometer, did you have anything in mind? Was there anything significant at the time about the barometric pressure?-- No, not that I was aware of. It might have been rising or going down a bit, but nothing drastic.

Well, can I put it to you that if the pressure had been rising, it could have been quite likely that the benzene smell could have been present but you may not have smelt it where you went to?-- That's quite possible.

So, in coming to your conclusion, having your so-called exchange of words with Mr Klease, you really didn't do it thoroughly, did you, and bearing in mind the question that Mr Clair put to you about going back and researching exactly what might have happened?-- Like I said, I was only going down there to - really for my own piece of mind. It was not - they were not my duties for the evening, or for that afternoon.

I appreciate that, but you -----?-- And the deputy that was in the panel was under the same impression that I was.

I appreciate that, but from the evidence in your statement, you had a concern about the men going down the mine. You obviously had a concern about what was or may have been occurring in 512 because you went down specifically to have a look for yourself?-- Yes.

And you came to a conclusion that the only hard task that you had that evening really was whether or not you had an argument with Michael Squires about whether or not the men were to go down the mine?-- On Sunday evening?

Yes?-- Yes.

All I am suggesting is that from what you have told us, it doesn't appear that your investigation was as thorough or may not have been as thorough as it should have been because had it been more thorough, then maybe you would have taken that step?-- I couldn't have made a more thorough investigation than the - what I had available to me at the time.

Yes, but you can't tell me now as to whether or not the barometer was rising or falling. Now, surely that would have been significant -----?-- I can tell you by going back to the report.

But it's not in your mind?-- No.

But you have indicated that it wasn't an important factor in your mind at the time?-- On Sunday night?

Yes - sorry, no, on the Saturday?-- Well, the barometer rising or falling on the Saturday really wouldn't have had much significance to an open panel. A sealed panel it would have, but not an open one.

It wouldn't have had any significance in a panel that's got a fairly extensive goaf area that you can't travel through?-- You could travel right down the ridges of it, yes.

Where did you go to?-- Me, that night?

Yes?-- I didn't go very far in at all.

That's right?-- But the whole panel was trafficable from there all the way down to there and across.

So, it's not possible - are you to saying to me now that it's

not possible that a rising barometer could have contained any atmosphere -----?-- I can't say it wasn't possible, but it had to be a fairly drastic rise in the barometer.

Would it?-- Yes, I think so, yes.

Well, did you go to the same area that the previous deputy said that he smelt the benzene smell?-- Yes, I think I did.

You think you did?-- I think I did.

But you are not sure?-- No, I'm not sure. I went across all roadways of the panel, not just in one spot.

You see, all I am trying to get at is whether or not when one deputy goes to ascertain what a condition in the mine might be compared to what a previous report was - and I am not suggesting that it never should happen - but I am just trying to ascertain whether or not the proper procedures are gone through to ensure that when you do it you know what previous conditions were and exactly what you are looking for, particularly in the area where we are looking at an area being sealed?-- That would certainly be very, very helpful, but all that information has to be made readily available. A lot of it is locked up behind closed doors and all that sort of stuff and you just can't get to it.

What would be locked up behind closed doors?-- Any information that you required about the panel.

It's not available to the deputies?-- I have probably lost the track of your questioning again.

The track of my questioning is whether or not when you went down the mine to check for yourself to see whether or not - as I understand it, whether or not there was a benzene odour?-- Yes.

Now, the very fact that somebody detected a benzene odour - and if there had have been a benzene odour, we have got a very dangerous set of circumstances, don't we?-- Yes, if there was one, yes.

If there was one. Yet another fellow deputy, who I assume is also an equally experienced deputy, or an experienced deputy?-- Yes.

Surely would know whether or not he smelt a benzene smell?-- He certainly would, yes.

We know we have got a set of circumstances where we have got quite an extensive goaf area?-- Yes.

A decision has been made to seal the panel?-- Yes.

In fact earlier than was originally planned?-- Yes.

So, we have got all the circumstances that suggest that something is going on?-- Yes.

Now, whether or not everybody has the same opinion or has the same advice at their fingertips, you, in your own mind, must have known that there was something going on, and if there was a benzene smell, then the situation was serious?-- If there was a benzene smell, yes, it would be a serious situation, and a haze, yes, it certainly would.

Exactly?-- It certainly would.

So, another deputy had reported that there was a benzene smell?-- Yes.

You have undertaken your own examination?-- Yes.

And my line of questioning was as to whether or not you were well enough equipped with previous knowledge as to what had happened in that panel to come to any conclusions?-- No, I probably wasn't well enough equipped.

Well, thank you?-- I was just trying to get your question right, that was all.

Okay. So, I mean, had you been equipped and had you known the other things that we have talked about, for example, that there was 21 litres of - sorry, that was the next day, that was the next day, or after your shift. Nonetheless, I think there was a similar reading prior to you going to make that inspection. I don't have the report available. I think through previous questions there was a reading of 10 ppm?-- I did not read that report.

That's right. So, had you read the report and had you been aware of the things that you are probably now aware of and made a thorough inspection, then maybe you wouldn't have questioned the fact of whether or not the previous deputy had in fact smelt a benzene odour?-- I would still have questioned it if I didn't smell it, yes.

To the extent that -----?-- To the extent of going to investigate for oneself. I could find nothing.

I have no further questions.

EXAMINATION:

PROF ROXBOROUGH: Mr Graham, I would like to clear up a little further your views and knowledge of the ventilation in 512, particularly around the big pillars. You said in response to questioning by Mr Clair yesterday that you had noticed occasional dead spots around the large pillars?-- Yes.

And indicating the area with the laser pointer, you moved the pointer all the way around the curve. Does that mean that there were dead spots occasionally all around the pillar?-- Yes, dead spots would vary, either in this roadway here, or this roadway here and sometimes along the edge of the pillars, there.

Wasn't there a greater tendency of the dead spots to be in the shadow of the pillar?-- Yes, there was, but depending on which way the ventilation was going.

The change in ventilation you attributed yesterday to robbing one part of the pillar to ventilate another?-- If we were mining this part of the mine - this side of the panel - there would be more ventilation over this side of the panel than there would be over that side of the panel, and if - yeah.

As I think Mr Morrison alluded to or stated or suggested this morning, those occasions when the air was moved around the panel was during the development phase?-- Yes.

Was it only during the development phase?-- As far as I was aware, yes - no - well, obviously you have to move the air around the panel on an extraction phase, but-----

You were in the panel and examined the panel on several occasions during the extraction phase, so even though that might not have been a production shift-----?-- Yes.

-----during those inspections, were there dead spots around the large pillars?-- Not that I was aware of, no.

Now, on the basis of your knowledge and experience as a mine deputy, would you expect the ventilation around the large pillars to change when the large pillars moved into the goaf area? At some stage those large pillars become part of the goaf?-- Mmm.

Would you expect the ventilation around those pillars to change when the pillars move into the goaf?-- I don't really know what to expect.

You wouldn't expect there to be a greater preponderance of dead spots around those pillars when they move into the goaf?-- There was a greater - dead spots would always become greater in your goaf area, regardless of where it was.

Sure. Would you know when the first of the large pillars moved into the goaf area?-- No.

When it became part of the goaf?-- No.

Would it have been around about June? I suppose we can get that-----?-- It would be on the sequence plan.

Okay, thank you. Can I talk to you briefly about your escape from the mine? You say in your statement that you were blown off your feet at about 11.40 p.m.?-- Mmm.

Could you say what time it was you reached the surface?-- I really wouldn't have a clue.

You wouldn't have a clue?-- That was the last thing I was worried about.

What happened when you did reach the surface? I think you said you went to the bath house, did you?-- I went to the bath house, yes, threw off a self-rescuer, had a cough and a spit and a cigarette - for what reason I don't know - went across to the No 2 bathroom area where the Mines Rescue office is, opened that up and started testing mines rescue suits.

You opened it up, did you?-- I don't know if I did or not.

At any stage after getting out of the mine, were you debriefed? Were you questioned by anyone as to the events in the mine?-- Yes.

At what stage did that occur?-- 2.30 a.m.

That was after you had been sent back to view the portals, presumably?-- Yeah.

By Mr Mason?-- Yes.

What happened to the other members of your crew when you came out?-- I really don't know. Three of the fellows - actually three of the fellows came with me to start testing the Mines Rescue suits, as they were Mines Rescue personnel, and I think the other fellows were just milling around.

Were you medically examined when you came out of the mine?-- No.

Did that surprise you?-- Yes.

Were you surprised-----?-- I was surprised we were all allowed to stay there, actually.

You were surprised to be sent back to work at 1.30 down the cut?-- Well, no, it was something I wanted to do.

You wanted to do it?-- Yeah.

What time did you leave the mine that morning?-- About 3 o'clock.

You were described with obvious justification by Mr Morrison

to be a very knowledgeable and experienced deputy, and obviously practical experience is very important in any deputy's curriculum and the development of your skills, but as we are learning very much during this hearing that technical knowledge is also very important, issues relating to spontaneous combustion - not only that, of course, but matters of support and ventilation - what would you consider to have been your most important source of technical knowledge? Would that have been your training as a deputy, or would it have been your participation in Mines Rescue, inadequate as that may have been? What was the most important?-- My participation in the Mines Rescue.

And Mines Rescue training is a sort of ongoing training process, is it?-- Yes.

Do all deputies go through the Mines Rescue training?-- No.

So that deputies that are not under Mines Rescue training are at a disadvantage in relation to technical knowledge being kept up to date?-- Yeah, I would say they were, yes.

Thank you.

MR ELLICOTT: No questions, thank you.

WARDEN: Anything arising out of that?

MR CLAIR: Nothing, Your Worship.

MR MacSPORRAN: No, Your Honour.

MR MARTIN: No, Your Honour.

WARDEN: Thank you, witness. You may stand down. You are excused. You may leave.

WITNESS EXCUSED

WARDEN: Do you want to have a short break, a lunch break, or a short break followed by a witness?

MR CLAIR: I don't know what arrangements people have, Your Worship, but it would probably be more time saving to have a lunch break now and then have one break during the afternoon rather than a break now, then lunch and another break during the afternoon. It depends on people's arrangements.

WARDEN: I think we will take the lunch adjournment now and resume at 1.30.

THE COURT ADJOURNED AT 12.07 P.M. TILL 1.30 P.M.

THE COURT RESUMED AT 1.36 P.M.

MR CLAIR: May it please Your Worship, I call Philip Henry Austin Draheim.

PHILIP HENRY DRAHEIM, SWORN AND EXAMINED:

MR CLAIR: Your full name is Philip Henry Austin Draheim?-- That's correct.

Am I pronouncing that correctly, Mr Draheim?-- You are, actually.

You are the mine geologist at the Moura No 2 Mine; is that so?-- Yes, of the Moura Mine itself, including No 2.

The whole of the Moura Mine area?-- Yes.

And that includes No 2 Mine?-- Yes.

You have the necessary qualifications, being a Bachelor of Applied Science from Darling Downs Institute?-- Correct.

Which you acquired in 1981?-- Correct.

You worked for a time for Carpentaria Exploration, a subsidiary of MIM Holdings at Mount Isa?-- Yes.

And then you started at Moura Mine in 1981 as a geologist?-- Correct.

You were initially involved in the open-cut, but you subsequently then got involved also in the underground operations; is that right?-- True.

Prior to June 1994 there was another geologist there, a Peter Ledger?-- True, yes.

But since then you have looked after all of the operations by yourself; is that right?-- Yep.

During the time when the other geologist was there, you were involved with the underground operations and open-cut operations?-- Yes, that's correct.

Now, you have set out in a statement, which is dated 5 October 1994, in some detail the duties that you were required to fulfil as the geologist at the mine?-- Mmm.

I don't propose to take you through every aspect of that, but I do want to touch on some of the aspects. In particular, I want to turn first of all to the duties that you had in

respect of the underground mine?-- Right.

And deal with those, in some respects, fairly briefly. You had, first of all, the duty of underground inspections in order to map any geological abnormalities or anomalies; is that right?-- Correct, yes.

Sometimes you would be called in by underground personnel when they encountered some sort of change in mining conditions or some unusual structures; is that so?-- Yes, that's correct.

Was there a geological plan kept progressively as mining proceeded through the area?-- In the development phase?

Yes?-- In most cases during most development, no, not a very detailed plan at all.

Well, in what way would the anomalies in any particular area be charted, as it were?-- Well, normally the main structural and roof conditions were determined by exploration and drilling and, over the last few years, in addition to that, with our in-seam drilling we have done that, and basically when a panel is completed in terms of development, the geologist would come in and map the place in detail.

That's after the development phase was completed?-- Yes.

While development was taking place, was there any particular plan showing the geological structure, the existence of any faults or other anomalies?-- Not on a day-to-day basis or weekly basis.

Before development started, was there anything drawn up as a result of drilling or-----?-- Yes.

So, there would be some plan that you would start with?-- Oh, yes, certainly.

And, of course, it would be that sort of plan that would determine to some extent where the next phase of development would be?-- Correct, yes.

But you say that there wasn't any program for updating that plan as development proceeded. If there was a fault or an anomaly which was encountered, it was simply dealt with on the spot in the underground situation, not put on a plan anywhere; is that what I understand you to say?-- Well, in the situation where the undermanager or whoever was in charge basically got a phone call and there was considered to be a problem, they would normally give me a call and I would come down and map that problem.

You would map the problem then?-- Yeah, yeah.

And what, that map would be kept?-- Yes.

Or would that information be transferred to some master map?-- Yes, that would normally be kept for use later on when the whole panel was put together on a plan, if you like.

It wouldn't be transferred to any master plan initially during development; it would be kept until the development had finished and then a plan of the section, or the extent of that working would be drawn up?-- Correct, yes.

You say that that would be before extraction commenced that the plan would be drawn?-- Yep, yep.

Would you be involved, then, in planning the method of extraction?-- No.

Not at all?-- No, only from a geological point of view in pointing out areas where problems existed.

So, if you are aware of some particular fault or abnormality in the roof structure, for instance?-- Yes.

Then there would be some way in which you would bring that to the attention of the people who were planning the method of extraction?-- Correct.

Is that so?-- Yes.

Was that a formal arrangement - when I say "formal", was there a particular set of plans or a particular way in which those items would be brought to the notice of the people designing the extraction?-- Yes, there was.

What was that?-- Well, after the detailed mapping was completed, we'd sit down and go through that geological plan, pointing out areas of problems where they would have to adjust or change their mining method there, or even not mine there.

When you said "we'd sit down", who would that be?-- Manager, undermanager in charge, engineer at the underground, occasionally the undermanager on that shift.

On the shift where there was some problem encountered, you mean?-- No, on that shift when we were going through the plans - on the extraction side of things.

Whichever undermanager happened to be there at the time, you mean?-- Yeah, and if he was available.

Okay. I'm perhaps jumping to another area of your activity in asking you about this, but in respect of 512 panel, there was some input from ACIRL on the design of the extraction panel?-- Correct.

Did you have any particular input on that?-- My input on that was fairly limited. I supplied borehole information, which gave them indications of roof strata, coal, floor strata, structural plans from that bore data.

So, you provided that. You weren't party to any ongoing discussions or-----?-- No.

Coming back to these duties that you have set out in your

statement, you have mentioned also the development and implementation of exploration drilling programs to provide information on, first of all, structure, in situ seam gas content, coal quality, seam thickness and, finally, the nature of the roof and floor strata to try and predict mining conditions. Now, did that duty - that's the kind of duty that you have already referred to in terms of planning or drawing up a plan of the area prior to even the development phase beginning in any particular area; is that right?-- Yes, that's correct.

This would be your initial, as it were, master plan in respect of any given area?-- Yes.

Drawn up, really, from the exploration drilling?-- Yep.

That would be borehole drilling?-- Yes.

That would, amongst other things, give you some indication of the problems arising out of the amount of gas that might be involved at the seam; is that right?-- Correct, yes.

It might also - it might not necessarily in respect of every part of the proposed area to be developed - but it might in respect of some parts also indicate any geological faults?-- Yes, definitely.

But it wouldn't necessarily indicate all of them. There is others that you would run into along the way?-- Well, it is the first step in looking at an area to develop - you know, a mine plan to decide whether that is a possibility to mine that panel.

You have mentioned as another duty "detailed inspection and mapping of geological features of any area which is to undergo second working extraction". The second working is the extraction phase that you have referred to?-- Yes, correct.

And you have referred already to using that as part of the system to indicate any potential hazards that might be involved in the second working?-- Yes.

Now, you mention as another duty your very heavy involvement in the gas drainage program, in terms of designing in-seam drill patterns and developing techniques. You also mentioned you had a close working relationship with Jacques Abrahamse in that connection?-- Yes.

This was an aspect that you were quite closely involved with - setting up, basically, what might be called the methane drainage program, or principally the methane drainage program; is that correct?-- Yes, that's correct.

I think you have mentioned in your statement that up to the late 80's, the methane drainage system was very crude?-- Correct.

And the main way of dealing with difficult gas conditions was that when they became too difficult to handle, production

resolved in one area and moved off to another?-- Yes, that's what happened.

That altered after about 1988; is that so?-- That would be roughly the time-frame, yes.

At that time, there was a grant from - I won't try to pronounce it - NERRDC?-- Yes, NERRDC.

I didn't want to be offensive in trying to get my tongue around that one, but under this NERRDC grant, ACIRL began a long hole drilling trial for gas drainage in the 5 South area; is that right?-- Yes, that's correct.

And it was found that gas flows from the longer holes which you have described as anything greater than 400 metres required that the gas be vented to the surface via a borehole rather than simply drilling boreholes which just allowed the gas to drain off into the return airway which had been the previous system use; is that right?-- Yes, that is correct. There was too much gas basically for the return airways to take.

Ones you had along the boreholes?-- Yes, so we actually stopped the drilling and put in a vertical borehole and vented the gas to the surface via that borehole.

So that really allowed more gas to be drained off the seam where mining was to take place than had previously been the case; is that right?-- Far more on advance and more safely, I believe, yes.

Associated with that - the development of that program - was there a trial with what was called the Dupont Directional Drilling Monitor?-- Yes, that's correct.

Can you just explain briefly what that is?-- Previous to that we had been using what's called a single shot camera, which is basically an instrument that gets pushed down the hole, takes a picture of the direction and dip of that hole, you pull it out and then read it and work out which way you're going. That would need to be done every, say, 12 to 18 metres. The instrument you are referring to was trialled on the ACIRL drilling. The Dupont tool actually sent the signal - the instrument was still at the end of the hole, if you like, but it send the signal up the rod string to a censor which decoded that signal and told you where you were.

So that there wasn't any need to interrupt drilling all the time?-- Well, one still had to stop the drilling, but it was a far more efficient and quicker method.

Well, it was initially found, that is the Dupont system, was initially found to be a bit unreliable at that stage but it has since been improved; is that so?-- Yes, correct.

Did this also tie in with the use of what is called a down hole directional monitor which in turn improved the productivity and hole depth?-- Yep.

In conjunction with that you also saw some improvement in the methane gas drainage system including the piping to the surface?-- Mmm.

Which overall improved the whole methane gas drainage system; is that so?-- Yes, very true.

Now, can I ask you this then: with the methane drainage system that was in place as at August of last year, the time of the first explosion, what would be the likelihood of an outburst of methane in the course of mining progressing into a panel?-- I would think extremely unlikely.

Why do you say that?-- Well, in terms of one, 98 per cent of the gas was drained, gone. So there was very little background gas during the mining phase.

98 per cent -----?-- Of that order, yes.

That's a measure that's been taken?-- Well, we have done measurements in various areas, yes.

And that was a bit of a contrast with what might have been the case, say, in the mid 1980s?-- Definitely, yes.

When the likelihood of an outburst of gas would have been much higher?-- Definitely, yes.

Okay. Well, now, one of the problems in draining so much of the methane out of the coal was that the coal tended to dry out a bit; is that right?-- Yes, with the gas flowing out it also brought moisture and water, correct.

And were there some steps that were taken to overcome that problem?-- Well, there was - one was a wetting agent used with the mining equipment, and secondly, in the 5 South Panel we were actually injecting water back into the holes with a wetting agent to put some of that moisture back in and improve the dry conditions.

Tell me, even with the drainage program completed in an area before mining advanced into the area and with, as you say, perhaps even 98 per cent of the gas gone, was there still some potential hazard there?-- Yes.

With gas coming out of the seams?-- Yes, a hole never actually ceased flowing methane. A very minimal amount on

every hole that I know of that would still be flowing out due to migration from areas outside the block, if you like, that you intended to mine.

I see. So you will still get a bit of a build-up of methane passing through the drainage holes?-- Yep, you still would get a vented flow.

How was this addressed then when mining was proceeding into an area where it might intersect one of the holes or in an area where there were holes that ran off the roadways in a particular panel?-- Well, from the inception the holes were designed not to be in any roadway as such, only intersected in cross-cuts so you didn't have to follow a hole to depth, if you like, all the time. Normal practice before 5 South was to mine through that hole gently, I guess would be a word to use, and then immediately put your brattice up past that hole so it was straight into the return airway.

So as to move any gas that comes out from the hole is taken outbye with the ventilation rather than going back up any - up past the miner and into the ventilation roadway; is that right? That's the incoming ventilation roadway?-- Yes, correct.

Now, what about where you had a methane drainage hole and you wanted to, in effect, prevent the methane from coming out of there. Was there a system used whereby there were water traps or water stops, with the holes being injected with water to block off the -----?-- Well, that was the situation in 5 South, to actually - prior to mining through a hole they actually put water pressure on it - or to inject water would be a better word, so that when they actually mine through it they mine through the water, if you like, then put your brattice up. Over time that water would flow out and you would get your gas - your background gas, if you like, dribbling out of the hole again.

What about in 510? Was there some system there with water building up or some system to ensure that water didn't build up in the methane drainage holes?-- In 510, yes, yep.

What was that system?-- There were water traps that basically - what's the word - diverted the water, if you like, to a separate container so it could be drained off from that and allow more efficient flow of the gas via the pipe work to the surface.

These were from what might be called the active drainage boreholes?-- Yes.

The ones that were still draining the adjacent areas?-- Yes, correct.

There would be water that would get into those holes that would be drained off, in effect, into a trap of some kind?-- Yes, correct.

And when that water was released from the water trap was it

the case that sometimes the methane pressure might have built up a little bit behind it and some methane come out on release?-- There were occasions where those water traps were blocked and they had to be desilted, if you like, but it was quite normal even for a normal water trap to be drained of water and vent some gas at the same time until all the water was out of the system.

You are familiar, of course, with the 512 Panel -----?-- Yes.

----- and the conditions that surround that. Was there anything unusual about the roof conditions in terms of the rock strata in the 512 Panel?-- Nothing any different to the other panels around it that I know of as in 511 and the 5 South which were either side of it.

Did you have any role in considering the ways in which the roof falls in the area could be controlled or was that a matter that fell outside your area of expertise?-- I was not involved in that side of things, no.

The extent of your involvement really was to advise as to whether there were any unusual features of the roof or any faults that might need to be taken into account when the actual pillar design was conceived; correct?-- Correct, yes.

But your role didn't go beyond that at all?-- No.

What about in 5 South? Was there any unusual feature about the roof structure in 5 South?-- No, I don't believe it was any different to any other in the immediate area. The only comment I would make was the gas drainage holes we did drill there indicated a possible feature further out due to the amount of water those holes made which was an unusual occurrence.

There was a lot of water coming back down the holes?-- The gas holes, more than normal, yes.

But was that indicative of any large pocket or anything like that in the seam or above the coal seam that might lead to some outburst of gas or anything like that?-- No, well, I believe it indicated a potential for a structure further outbye, as in further on in the mining process.

That's beyond the working face that was being worked as at 7 August?-- Yes, yes.

How far beyond?-- Well, it ran across the - appeared to run across the panel from the holes we drilled and it was of the order of probably 100, 300 metres, that sort of thing.

Beyond the working face?-- Yes.

As at 7 August?-- May have been a little closer than that by then.

Would you see that as having any bearing on what might have been happening in that panel on 7 August at that work face?--

No.

Thank you, Your Worship.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Draheim, can I just ask you to tell me a little bit about the structure of the rocks in the roof in the No 2 Mine? You mention in your statement you are aware of some research that was done on those rocks by Colin Ward of the University of New South Wales?-- Correct.

You supplied him with some samples back in November 1993?-- Yes, correct.

And your statement is dated October last year and says you are not aware of the outcome of the research carried out by Ward. Have you since learned anything about the research that Ward has carried out?-- Yes, at that interview you are talking about there I did receive a one page copy of some of the results of that investigation.

That's Ward's results?-- Yes.

Did they indicate, in effect, that there is a very low prospect of the rocks in that area being responsible for frictional ignition?-- Yes, that's how I understand it, yes.

Just dealing with the gas drainage program, as you've told us already, I think, one of the effects of that is to dry the coal out?-- Correct.

And that can be a problem when you are mining in the sense that it can be very dusty and unpleasant underground?-- Yes, that had happened in the past.

The drainage program itself, although largely successful in removing the bulk of the methane, was not able to remove it entirely; is that so? You would still have methane at the seam?-- In the block, normally, to be mined, the residual - the gas content remaining was of the order of .5 to 3 cubic metres per ton.

Which is very low?-- Which is considered - yes.

Low in terms of mining the seam. You still have at least that much methane still remaining?-- Yes, correct.

Now, is there any effect that the drying out of the coal in that fashion has on its liability to spontaneously combust, that is the coals dry, having been drained of methane?-- I don't know.

Not your field?-- Well, I have never considered it actually, but -----

When the coal heats normally you would have a period when the moisture would be heated out, is that so, of the coal?-- Sorry, when the moisture would be -----

Heated out, consumed by the heating process before the coal itself was heated?-- If you had a heating taking place, yes, I guess you would dry the coal out, yeah.

That would be the first process, if you like, heating the coal, drive off the moisture and then the process continues; is that what normally happens?-- Well, you are out of my field a bit, I think.

If you don't feel comfortable talking about that area that's all right. You consider that to be out of your field?-- Yep.

Now, after the event on 7 August there were boreholes drilled to ascertain the atmosphere inside No 2, weren't there?-- Yes, correct.

And those boreholes of necessity passed through other seams of coal?-- Correct, yes.

Was there a difficulty with contamination of the samples coming out of No 2 as they passed through the other seams?-- Yes, there would have been contamination from the above seams producing gas.

Contamination being the residual, whatever it was, even though it was small perhaps, residual methane in the other seams would contaminate the atmosphere coming out of No 2?-- Well, there actually would have been quite reasonable flows, I would think, coming from the other seams. One would need to sample from below those.

Sample from below them or is there another way of eliminating that problem, that is by casing any boreholes that are put down into No 2, for instance?-- Yes, you could isolate it by casing all the way, yes.

That's a totally appropriate and sensible way of eliminating that problem?-- Yes, one could do it that way, yes.

That would certainly be a way of ensuring you wouldn't get contamination from the other seams?-- Correct, yes.

Do you recall there being an event where there was an outburst of methane from the floor of a panel?-- Now, could you -----

I might have the wrong terminology, but what about the 5 South Sub level - sub panel?-- 5 South Sub panel?

Was there an incident there where there was an escape of methane from the floor in that area?-- Not to my knowledge.

You don't know anything about that?-- No.

I take it it is the case though that the methane gas can come

from the floor of a particular panel, there is no reason why it can't come from the floor area?-- As in interburden between seams or the seam itself? I'm not quite sure what your question is.

Well, the floor of a roadway, for instance, as opposed to the roof or the seam itself?-- Well, normally they mine to the roof and left coal in the floor. From our cores we have taken when we have conducted in-seam drilling it has degassed the seam, both upper and lower, the coal that's left in the floor. So I would expect no difference in the floor coal, if you like, to the coal you've mined to be drained.

Anyway, you don't know anything about any escape of gas from

the floor in the 5 South Sub level?-- I'm not quite sure exactly what you mean there.

All right, I'll leave it then. Wally's workshop, do you know where that area is?-- Yes.

Is that the 5 South Sub level?-- Okay, I know the area you are talking about, yes, righto.

Does that help you recall such an event of an escape of gas from that area, Wally's workshop?-- That is possible because that area wasn't drained as such with drill holes. That would have been before my time and, no, I'm not aware of it.

It's before your time?-- Yes.

If there had been such an escape of gas in that area and it remained unventilated in the ordinary course, you would expect there could be a build-up of an explosive mixture in that area?-- Given the area wasn't ventilated, yes.

Thank you.

CROSS-EXAMINATION:

MR MARTIN: Mr Draheim, just a couple of things, if you wouldn't mind. As part of your discipline in applied science and geology, did you acquire any expertise in relation to spontaneous combustion? I think you probably have already answered that?-- No, no training.

No expertise either, I take it?-- No.

It's the case, isn't it, that the Moura coal seams are known to be gassy; that's right, isn't it?-- Gassy, yes.

Can you just help the Inquiry - at the bottom of page 4 of your statement, top of page 5 you refer to drainage of methane including piping of methane to the surface and to the atmosphere, I suppose. What sort of volume are you talking about on a daily basis, or were talking about whilst the mine was in operation?-- As you said, our seams were very gassy. They readily give off methane and as such we had very high initial flows of gas from our holes which tapered off over a very quick period of time to a background level that continued over a period of months, but depending on the length of the hole, flows up to 25 litres of gas per metre of hole per minute.

Well, could you just give a volume which went to the surface per day out of that pipe in No 2?-- At the time of the incident?

Well, approximately at that time?-- At that time I think it

was just under 50,000 cubic metres a day was being vented at the surface in two areas.

I think you told Mr Clair of the re-injection program into the boreholes or drainage boreholes; do you recall speaking about that?-- Yes.

Had that been done in respect of 512 Panel?-- No, that had not.

One final thing, if you would, please. Say, after 1 June 1994 did you learn anything, or were you told anything by any of Mr Abrahamse, Mr Mason or Mr Schaus or indeed any of the undermanagers about the CO parts per million or CO litres per minute in 512 Panel?-- No, I was not told by anyone that worked at the underground anything about that sort of thing.

Thank you.

CROSS-EXAMINATION:

MR MORRISON: Mr Draheim, can I just deal with one point that was raised by Mr MacSporran? The methane drainage in-seam gas line runs, as the name suggests, within the coal seam ahead of where you are to mine?-- As in the drill holes were drilled ahead of the workings, yes, sorry.

And in the old days they were a short distance, nowadays they are 400 plus and now even up to 800 metres long?-- Correct.

The theory being that the longer you can set the hole in, the greater the area you can drain, the bigger the area you can then develop and mine?-- That's the basic principle, yes.

It being perceived that it's a good idea to pre-drain this seam or any coal seam as much as you can?-- Well, in the Moura situation, if it wasn't pre-drained, we wouldn't be able to mine it safely.

And for that reason the lines are drilled a substantial way ahead and then the methane piped out to the surface?-- Correct.

That procedure of piping out to the surface from close to the gas holes is not followed elsewhere, is it?-- No, I believe we have a luxury that many other mines do not have.

In New South Wales, for instance, they don't do that?-- No, not at all.

There the gas is brought into the atmosphere, and the gas travels quite a distance around the mine before it's taken out?-- In most cases in New South Wales they use what's called a ring main where they hook their holes up to a big pipeline that runs around the entire mine to a dedicated

borehole and that's the borehole they use for the life of the mine.

So, they have got a greater distance of gas running through pipes around the mine before they actually take it out?-- Correct.

So, we have here, or in Queensland at least, or at this mine at least, an improved system and a luxurious system?-- I believe so.

But that drains principally just the seam, doesn't it?-- The seam we are mining, yes.

No doubt it has or could have some drainage effect on other seams, but it would be hard to detect that?-- Personally I would doubt it would have a lot of effect on seams above and below.

All right. That's the gas drainage. Once the drives are put in and the panel developed, there is still a possibility for interseam - not intraseam - interseam gas flow?-- There is potential, yes.

Particularly if you have geological strata or geological aspects of strata such as fault lines where gas can migrate?-- Correct.

Which is how you can get things such as are called a blower in the floor?-- Yes, that would be right.

Likewise, the roof, there is no reason for it to come to the bottom seam as opposed to the top seam?-- True.

So that as good as this system might have been, you could never eliminate that as a possibility?-- No.

Do you know of any way in which you could eliminate that as a possibility other than not going down there at all?-- Well, we were experimenting with vertical holes and attempting to drain gas from the seams above and below the seam we intended to mine by a method called fraccing.

And that was in its early stages?-- It commenced in the early 90's and - yeah, so it was in its infancy, yes.

But still it was, but for this incident, an ongoing program?-- Yes.

So, there were attempts being made to cope with that residual problem positively?-- Correct, yes.

And I think that procedure is followed in some respects in some mines in New South Wales, they have interseam drainage?-- Yes, there are a number of mines down there that do drainage into their floors and roofs.

So far as you are aware, that program or those steps taken in New South Wales have a measure of success and are, therefore,

worthy of being followed?-- In their situation I believe they help them considerably, yes.

The seams may be a little closer down there than they are here?-- Yes, that would be the problem in our situation of actually being able to intersect underlying and overlying seams because of the distance between them.

You are talking distances in these seams of something like 40 metres, I think?-- That would roughly be an average, yes.

I don't need exacts, but it's a considerable distance to conduct such an interseam drilling program?-- Yes, correct.

Can I ask you about a couple of the stages of mine development that you mentioned to Mr Clair? There are several stages, I think, that one has to go through from a geological point of view in the development of a mine, and the first being exploration drilling?-- Correct.

Just tell me, if you could, what's the purpose of the exploration drilling? What are you looking to find out?-- Okay. (1) to find the actual depth of the seam from the surface so you can put a plane to it; (2) to actually have a physical piece of the - a core, if you like, of the roof, the coal itself and the floor material for testing both in terms of quality - all the quality parameters that the coal is tested for. Also its gas content initially in situ, its thickness.

And you were also given cause to look at the structure of the rocks in between, the seam - not the actual seam of coal, but the strata in between the seam?-- Yes, yes, it was normal to put a core hole basically from the first seam encountered in the sequence at Moura all the way through the last one.

And, no doubt, those cores of rocks below and above coal seams are of great interest to geologists but not to mine managers, I take it, except the results?-- I guess that's correct, yes.

So that you would actually use the information from the exploration drilling in a variety of ways, both in respect of the coal itself in the ways you have described and in respect of the other strata?-- Yes, correct.

And would the cores be used in a particular way in terms of gas content? Would you have to do something to the cores?-- Well, the coal itself to determine gas content, it's basically - the seam is cored, it's pulled out of the hole and sealed in a sealed container as quickly as possible. The amount of gas that bleeds off that coal is measured over time to determine the amount of gas that's within the coal that will come out in the mining process.

The analysis of the coal core that you have referred to before, is that in relation to its - what might be termed as marketability, ash content and so forth?-- Yes, correct, yes.

On the exploration drilling stage, in terms of geology, what do you expect to find or expect to determine?-- Structures that are more on a macro scale that would stop the development of a mine in a certain area.

We are talking about things such as fault lines perhaps?-- Yes.

Which would actually impede an entire panel or entire section of the mine rather than small features that might impede one roadway or one cut-through or something like that?-- Certainly, correct.

Having determined your structural problems, is there another step in the process towards developing the mine in relation to selecting the block that you are going to mine?-- Well, if one did drill and determine there was a large structure there, one would drill it more closely to put a definite limit on that, say, "Well, this is the limit we could go in this particular direction."

So, the second stage, that is determining the block, is virtually hand-in-hand with the first stage?-- Yes.

At that stage do you have input from mine management as opposed to geologists and drillers?-- Well, once that information is gained, that's the basis on which the long-term plan of the mine, if you like, is formulated.

So, having got that basic strata, geological structural details of the strata and all the other information you have got, it's then sit down with mine developers or mine planners?-- Yes.

To look at how the mine might go?-- Yes.

And once you pick a particular block of coal for mining, I assume without knowing that it's planned to be mined some considerable distance ahead of that selection?-- Yes, it's scheduled into a three to five year plan, yes.

And is that when consideration is then given to the drilling program?-- In terms of methane drainage.

Gas drainage?-- Yes.

Prior to Mr Abrahamse joining the mine, was it the case that every now and then ACIRL would be involved in geological testing and planning?-- Before his arrival, yes, they had been there a number of times.

Since his arrival at the mine, has it been the case that ACIRL has been more closely involved, particularly with panel design?-- Very much so, yes.

And if you pause for a moment and think about 512. Was ACIRL closely involved with the panel design of that panel?-- Yes, I believe so.

Having selected the block, is the next step then to actually put in the drives for the panels?-- Yes.

And it's only when you have done that - if you turn around to the model behind you, we are there looking at 5 South and below it 512 - the block would be pre-drained and then the drives driven and the cross-cuts formed?-- Yes, that is correct.

And from, as it were, the most inbye end of such panels consideration would be then given to in-seam drainage ahead of them again?-- If you were to extend that panel, yes.

Now, at the stage when you have formed the panel by drives and cut-throughs, obviously you obtain, as you told Mr Clair, I think, geological information during that process?-- Correct.

The miners might strike all sorts of geological features which you are notified about?-- In most cases, yes.

And sometimes if it's considered important enough, you are called down into the mine to have a look at it?-- Yes.

But it's after that and before extraction that the detailed mapping takes place?-- Yes, that is correct.

And does that involve you personally as a matter of course?-- Normally it would. In the case of 512 I was actually on holidays and the other geologist there at the time actually did the detailed mapping.

I have probably misled you. I didn't mean in reality you personally, but the geologists?-- Yes.

The geologist actually goes and walks the panel?-- Yes.

Map in hand, pen in hand, whatever, checking everything out, looking at the roof, ribs, the floor, putting everything down that can be seen?-- Correct.

And then that detailed geological mapping forms the basis of notification of problems on the way through extraction?-- Yes, correct.

But it's updated, isn't it?-- Updated?

As a result of extraction anything encountered that wasn't known before?-- Yes, it was normally updated by the deputy and the people working in that panel more so than myself or the geologist.

In terms of 512, even though you didn't map it yourself, you, I take it, are familiar with the geological features of 512?-- Yes, correct.

Did the panel perform much as it was predicted?-- I don't believe it was any different to any other panel in terms of the roof conditions in the area.

Nothing unusual about it?-- Not overly, no.

In terms of the ability of the roof to stay up, or, conversely, its ability to fall in a localised way, no different to other panels?-- No, nothing unusual.

As you understand it, most of the design of that panel - I am sorry, I start again. You weren't involved in the design of 512, as I understand what you told Mr Clair earlier?-- That's correct.

Now, after having mapped it, is the information that you gain as a geologist conveyed to the miners?-- Yes, it was normal procedure to have a meeting with all shifts and go through that - all facets of the extraction side of things, which included a presentation on the geology and the conditions they could expect and areas to stay away from or watch, etc, etc.

This would happen with each panel?-- Yes.

So, the dissemination of detailed geological information about a panel was not a new thing to these miners, they were used to sitting there at seminars and hearing that stuff?-- Well, it has been in place over - I believe it would be a couple of years now, I would think.

And was there some other step being taken to improve the way in which miners could understand the geological features?-- Yes, the next area that was due for extraction, we were looking at a method of trying to give them a more visual feel of the rib conditions.

Is that by actually marking the ribs?-- By actually producing a plan which - basically the more colour you had on that rib, the more wary one needed to be of it or stay away from it, sort of thing.

So, there is going to be a different style of map, colour-coded to warn people, or to at least notify them?-- Yes.

In a much more dramatic way?-- Yes, something most people could understand, quite simple.

Now, in relation to the methane drainage, had there been improvements in that that you discerned in the last few years in the overall approach to the program and the use of drillers?-- Yes, to a large degree.

Can you tell me what that was?-- Well, it was on a number of facets: one, change of machinery; the technology in actually doing the survey, finding where the hole was. We had recently reintroduced - what was that original Dupont tool in a different form and it was performing very well. The actual in-seam gas drainage drillers were on the job more so than before in terms of actual drilling time.

Before were they taken off drilling to go back to mining and off mining to go to drilling?-- Well, normally, yes, if a crew was short on the mining side of things, people may be - or it did happen that they were taken off the in-seam drainage drilling and put in the mining crews.

And the improvement was really to have people who were virtually dedicated drillers?-- Yes, that is certainly one of the major ones, yes, and the training and expertise they had developed over that time.

Was there some particular input into the improvement of those systems by some particular person?-- I was heavily involved in trying to improve the situation, along with Jacques Abrahamse and many of the drillers themselves.

Did you have quite a measure of success in doing so?-- Yes, I believe we were going ahead in leaps and bounds.

You mentioned to - I think it might have been Mr Martin about finding out about Mr Ward's results of his testing. You received some results about the testing on Moura sandstone, I take it?-- Yes.

That would be roof samples?-- Yes, they were samples taken from the waste at Moura No 2.

And without giving us the details - the finding from a geological point of view - the determination is that that sandstone has so little quartz or silica that it has a very low chance of producing frictional ignition?-- Yes, that's how I understand it.

The sum total of it?-- Yes.

As you understand the testing of the coal from the Moura seam - that's the D-seam - does it have a particularly - did it have a particular ranking for its liability to spon com in terms of very low, low, medium, medium high?-- I actually do not know a lot about any testing done on that particular coal floor for spon com, but in my time both underground and around that area in the open-cut pits, spon com I considered was not a high probability.

It was the sort of thing one did not encounter very, very often at all?-- No.

Thank you. I have nothing further.

CROSS-EXAMINATION:

MR HARRISON: Mr Draheim, you have spoken of what was done in 5 South in terms of the predrill drainage holes and you spoke of the use of water. Can I ask you if you're aware of any occasions in relation to one of the drainage holes having been intercepted in 5 South whereby it was necessary to use a hose connected up to one of those drainage holes which had recently been intercepted to run methane away from the workface area?-- No, I was not aware of that.

Are you aware of that type of situation having occurred elsewhere throughout No 2 on previous occasions?-- If I understand you correctly, yes, that sort of thing has happened on other occasions in other areas, yes.

Have you understood that that has occurred in circumstances whereby it was deemed prudent by the person in charge to do that just in case there was a build-up of too much methane and that presented possible danger in the event of any source of ignition?-- I would think that would be done on a safety side of things just to take that bit of methane gas out of the incoming air flow, if you like, and run that pipe over to the return.

I suppose it follows from what I just asked you, but I take it you weren't made aware of a particular occasion on the afternoon shift, on Friday, 5 August, two days before the explosion, whereby a pipe was run from an intersected borehole by the acting deputy in charge at 5 South?-- No, I wasn't aware of that.

The evidence given by that particular deputy was to the effect that he obtained readings of in excess of 5 per cent at the - what I might term the exit of the hole that had been intersected - of methane. You have never been told about that?-- No.

And just to paint the picture for you, his evidence was that while he had only registered up to 5 per cent - and it could have, in fact, been more than that - he used the figures possibly 8 or 9 per cent, and just again to complete the picture for your benefit, he did say that some distance back that would dilute to .3 per cent?-- It was a very small flow at the hole.

In those circumstances, as described, would you nonetheless agree that it would be prudent to take the steps that were taken there in terms of using a hose to run that methane away from the work face?-- To remove that gas from the intake air and put it into the return air?

Yes, to get it away, in effect?-- Obviously it would make it more safe, if you like, yes.

You were involved, were you not, with the sinking of the

boreholes after the first explosion, but before the second explosion; is that correct?-- Correct.

And did you become familiar, as a result of that, with the behaviour of the gasses? Perhaps I could put it this way: the behaviour of the holes in whether they were venting or whether they were sucking air?-- Yes, I did monitor that.

Now, was there a borehole in 512 during that period?-- Yes, we put a hole in behind where the seals would be.

Did you monitor the behaviour of that for that period that I'm talking about - between the explosions?-- Yes, that's correct.

What was the behaviour of that?-- The borehole behind the 512 seal was venting.

Was there a further borehole drilled somewhere in the area of the 11 cut-through in 5 South?-- Yes, there was, correct.

And what was the behaviour of that?-- That was sucking gently, as I would expect from a borehole going into a workings that was being ventilated.

Was there another hole drilled relatively close to the work face at 5 South?-- There was.

And how would you describe the behaviour of that?-- That hole was sucking violently.

Violently - or was that illustrated in some way to you?-- Well, we were concerned about it sucking oxygen into the pit, so I actually put a 20 litre plastic bucket over it, which had subsequently sucked in and cracked.

From what you have described of the characteristics of these three boreholes, did they cause you any concerns in terms of the potential source or site of the initial explosion?-- Well, I guess what I would say in my opinion was that the hole outbye in 5 South was quite normal of a hole or pit that was being ventilated and that was sucking gently. The 512 hole did have a bitumeny smell. I believe it showed characteristics I'd expect of a sealed section that was venting, because it had built up some pressure over time. The hole cut outbye through 5 South; I can't explain.

The combined effects of these cause you some concerns in terms of 512 being the possible site of the original explosion?-- Would you ask that again, please?

I will put it another way: did it affect you in the sense that you felt that perhaps the source of the initial explosion could have been elsewhere than 512?-- Certainly makes one think, yes.

To the extent that, to you, it appeared consistent with the fact that it may not have been in 512?-- Well, from what I saw from the boreholes, you have mentioned - the only thing

that was strange was the one at 5 South.

Strange to you in what sense?-- In the sense it was sucking so violently.

And in terms of what I'd asked you about possible sources, what was strange about that?-- Well, at the time my thinking was that possibly the hole was trying to suck oxygen for whatever reason to feed a fire, or whatever.

And did you have some concern that the hole behind the seals in 512 was not doing the same thing?-- Certainly it seemed to give the characteristics I would have expected.

Would have expected of what?-- A hole being behind a section that was sealed.

If I can just ask you something about methane gas drainage ranges? Was there a range or a methane gas drainage range in the general air opposite 512 at that time?-- Yes, there was.

If I showed you a copy of a plan - it is plan number 45-23 for the record - would it be best if I have it placed up on the board, Your Worship? I am going to ask him to point to a few features there. Perhaps if it could be placed on the board? With a bit of luck, Mr Draheim, there might be a laser pointer in front of you. The black thing with a button, it will produce a red light where you want to point. Can you point out the range I was asking you about?-- I would say it is that one running down there and you come to a vertical borehole situated there.

Now, just for the record, you have illustrated - you might just describe the general positioning of that relative to the various panels and also describe the positioning of the borehole?-- Well, that particular range was draining those holes up there, plus those two holes there ahead of the 510 panel.

You have illustrated two holes ahead of 510?-- Yes.

You have illustrated a line of holes perpendicular to 510; is that right off to the right-hand side as you see the plan?-- That's correct, yes, these nine holes to the north-east.

And there are, in fact, some further holes, are there not, running from 5 South, effectively, or roughly parallel with 510; is that right?-- That's these holes here, yes.

So, have we described there generally the holes that that range was draining?-- They are the holes, yes.

To your knowledge, after the initial explosion, was it apparent that there had been some damage somewhere to that range in terms of the behaviour of that borehole you have indicated?-- After the first explosion, there was no gas which had been venting out of that vertical borehole coming out of it.

The fact that there was no gas coming out, did that suggest to you that obviously there was some damage somewhere in relation to that range in the first explosion, or associated one?-- I believe the gas line must have been knocked down or broken, yes.

Bearing in mind that that occurred, did that fact of itself again cast any doubts in your mind in terms of 512 being the source of the initial explosion?-- Well, that particular pipe range, as you can see, runs past 511, 512 and even across the roadways that come out of 5 South.

Now, getting back to what I asked you, did that, in fact, cast doubts along the lines of what I just asked you?-- It certainly opened some options, I guess, yes.

And if it did cast such doubts, why?-- Well, I would think - my opinion - if it was the 512 seals that had gone, for example, and that was the reason that gas line was - or range was knocked down, basically you had a fire here and a huge source of explosive methane gas just across the road, and I find it hard to understand the time between the first and second explosion. I would have thought it would have been basically one after the other.

In terms of one linking up with the other, is that what you are saying, in effect?-- Well, I guess a gas finding a fire just across the road.

I tender that plan, Your Worship. If I may - I think Mr Barker is getting the one from the Court. If I could have mine eventually?

MR CLAIR: It is part of Exhibit 8.

MR HARRISON: It is part of that general exhibit, yes.

WARDEN: Do you want to tender it especially by itself?

MR HARRISON: Yes, if I could tender it on its own it might be best, considering I had a fair bit of evidence directed to it.

WARDEN: Exhibit 146.

ADMITTED AND MARKED "EXHIBIT 146"

MR HARRISON: I have nothing further, Your Worship.

EXAMINATION:

MR PARKIN: Mr Draheim, just a few points. In your statement you said that you don't think outburst was a possibility in the Moura seam. In the 512 Panel area what were the gas levels in cubic metres per ton prior to drilling?-- Prior to drilling of the order of 12 cubic metres a ton.

So am I right in saying then that the methane drainage reduced that down to something like between two and three metres per ton?-- It would have been less than that, probably .5 to, say, one and a half, around that area.

Did you apply any suction at all to those holes? You mentioned earlier that it would just freely give itself up, the gas. Did you apply suction after a certain time?-- No, not at all. It sat freely flowing. It was our opinion that suction would only complicate the whole process so we kept it simple and it was effective.

Did you experience any blocked methane drainage pipes due to water or silt in the system?-- Yes, we did have both blocked holes and both blocked water traps. We had that.

How often did that happen? Was it on a regular basis or -----?-- I would say that's a fairly rare occurrence.

Did it cause you some problems when it happened?-- Yes.

What were those problems?-- Trying to clear the blockage from the borehole.

Did you have a build-up of gas anywhere in the sections?-- Sorry?

Did you have a build up of gas in the section?-- In a situation like that normally that gas eventually runs to holes parallel to it anyway, it just slows the process down.

Okay. Tell me, how successful was the water injection for dust suppression?-- My understanding from the comments made by me that it had improved the situation by 100 per cent sort of thing as in terms of dust while cutting.

Are you aware of any rib failures in the 512 Panel which caused problems during extraction?-- No, I'm not.

You are not aware of any?-- No.

You stated that spontaneous combustion was not a high probability at Moura; why would you say that?-- Well, there was, to my knowledge, prior to the incident, one recorded suspected heating which I have since found out was confirmed. Apart from that, in the time I have been at the underground and been in numerous waste areas I've never seen any indication of heating in any of those areas.

Do you know what the incubation period is for Moura coal?-- No, not at all.

No further questions, thank you.

EXAMINATION:

MR NEILSON: Yes, Mr Draheim, I'd like to just pick up on the last question that Mr Harrison asked you. You indicated that you were somewhat surprised that if the initial explosion had occurred in 512 that there was such a long time between that and the second explosion?-- Correct.

Can you elaborate on that a little bit further for me, please?-- Well, the majority of our gas at that time was flowing up that gas range up there to that borehole, so of that 48,000 cubic metres roughly which I measured on the Friday, 43 of it was flowing up that pipe line.

And what diameter is that pipe?-- Six inch. Now, given that that had been knocked out after the first explosion, which it was because there was no gas coming to the surface, you had a readily available volume of gas pouring out there, and given that the 512 seals had been blown in and there was a fire in there, you have the fuel and the ignition source sitting next door to one another.

Let me ask you a question: the gas range that you are talking about, is that at a higher point or lower point than the entries into 512?-- Higher point.

Methane is lighter than air, isn't it?-- Correct.

It's unlikely that it would flow downhill?-- Well, there would have been some form of ventilation of some sort in that area -----

Well, can I put it to you and, you know, maybe this will be explored further when we come to expert witnesses, but if the explosion did occur in 512, and I'm not suggesting at this stage that it did, but if it did it would be unlikely that there would be much oxygen left in the panel?-- That would seem reasonable, yes.

So even if methane could find its way to run downhill, which I question, it would be very unlikely, in my view, for the second explosion to happen quickly after the first in those circumstances. Can you think about that and maybe you would like to answer the question in a different way. I mean for a start methane would not run down from that gas range, would not find its way by natural causes into 512, would it?-- Being no expert on ventilation or anything like that -----

I'm not asking you -----?-- I'm just saying from my point of view you have a source there and a broken pipe line next door to one another. I'm not an expert and that's what I'm -----

Yes, but what I'm asking you is - you do know a lot about methane gas?-- Yes.

And its density?-- Yes.

It doesn't flow downhill, does it?-- One would not expect it, no.

No?-- No, that's correct.

So it would be highly unlikely, unless you had a significant ventilation force to either suck it or blow it in the direction of 512, it would be highly unlikely that it would find its way into 512?-- I would accept that, yes.

And I mean if it did and there was no oxygen there and we may assume that there would not be for a period of time, then nothing would happen in any case, would it?-- No oxygen, no, nothing would happen.

We do know from readings taken in the general course of the area subsequent to the first explosion that there was very, very little oxygen?-- Right.

So are you now surprised that there was such - or could have been such a period of time between the first and second explosion?-- From that point of view I'd say no, but I'm still a bit bewildered there.

What is it that you are bewildered about? I mean I don't mind you being confused, but I don't want to be confused too?-- Well, in terms of having a - to me still having a broken pipe line like that and given that amount of methane flowing around in the place, whether there was -----

It's an unknown quantity of what the ventilation may have been doing?-- Exactly.

I don't know that, you don't know that?-- Exactly.

We do know water doesn't run uphill and methane doesn't run downhill on its own natural course?-- Yep.

I have no further questions.

EXAMINATION:

PROF ROXBOROUGH: Mr Draheim, the seam that we are working at No 2 is the D Seam; is that correct?-- That's correct.

And the seam above it is the C Seam?-- Yes.

And I think you said in response to a question or comment from Mr Morrison that the separation is about 40 metres vertically; is that correct?-- Varies from 30 up to 45.

Of that order?-- Yes, yes.

Could you, as the mine geologist, give us a brief description of the strata between the D Seam and C Seam starting with the immediate roof, and in that I'd like, if you can, from memory, give us an idea of the thicknesses of the various strata between the two seems?-- Okay, the general roof strata above D Seam between D and C Seam, initial up to a foot, .3 of a metre, the roof was normally a shaley, siltstone material, very fossiliferous, well bedded, flakey, fall off quite often during the mining process, and in 95 per cent of the time above that was a massive sandstone all the way up to C Seam with large jointing in it, very homogeneous, no bedding whatsoever really.

So fairly massive -----?-- Very massive.

----- bed of sandstone?-- Yes.

Sandstones are composed predominantly of quartz; is that right?-- No, it's very low quartz content.

Do you have any idea of what the quartz content is of the sandstone?-- Well, from the work done after the No 4 explosion - there was some work done by the then underground geologist, Ian Poppitt, where they went looking for sandstone with 3 per cent plus quartz - I seem to remember the 3 per cent number for some reason - as in the frictional ignition idea, and I believe they did find one sample where it got up to 1 per cent.

Strange that it should be called a sandstone if there is so little quartz in it. In any event, the rock, would you in general geological terms describe it as a brittle rock? In other words it snaps rather than bends?-- Given its massive nature I would think it would snap eventually.

Now, is it conceivable given the design and the dimensions of the 512 Panel that the zone of influence from 512 could extend up to the C Seam in terms of the strata displacements that might be associated with the extraction in 512?-- I'm sorry, I don't quite understand the question.

What I'm trying to get at is given that a lot of coal has been taken out in that part of the mine, that there will have been some ground movements associated with that extraction. I'm not suggesting that everything has collapsed, but there will be strata movements?-- Yes.

And those strata movements we have ascertained - or we have determined that these rocks don't bend very much before they start breaking up, before they start cracking - I'm not saying that they collapse, but fissures and cracks could appear in the rock?-- Potentially yes.

And would you imagine that those cracks that might appear in the rock could extend to the C Seam and, however incipient they may be, therefore provide a possible root for gas from

the C Seam to come into the D Seam?-- Yes, that has happened in the past.

That has happened in the past and that is -----?-- Our major joining is very persistent throughout that massive sandstone.

And the C Seam is also highly gassy?-- Yes.

How would you rank it compared with the D Seam?-- Of the same order.

Much the same?-- Yes.

Now, you are aware that ACIRL was involved in the design of 512 Panel?-- Correct.

Were you as the mine geologist involved at all? Did ACIRL seek your advice or your input in any way?-- As I said earlier, the only input I had was to supply some borehole logs of the roof strata.

And that's as far as it went?-- Yes.

As a geologist do you have any thoughts on the design of the panel in relation to strata movements and stability?-- Not being an expert in that field, no, not really.

Fine, that's okay. Within the seam section itself in D Seam were there any stone bands in the seam?-- In D Seam?

In D Seam?-- Yes, there was one in some areas.

Were there stone bands in the seam in 5 South or in 512 Panel in that area?-- 5 South area down - the south eastern corner, yes.

Could you give us a broad description of the nature of that stone band?-- Okay, normally was about three and a half metres from the roof, the band that actually thickened to the south east and it's normally a mudstone, if you like, which in some areas was rather puggy.

Was it perhaps more like a sandstone than the roof that you described previously?-- Sorry?

I say, was it more like a sandstone than the roof that you described previously?-- No, not at all, very fine material.

Low quartz content?-- Well, not that I'm aware of. I wouldn't know if it's been tested even.

You don't know if it's been tested?-- No, I would think not.

Have you heard or seen of any sparking having been caused by continuous miner cutter picks in any of the strata be it the roof rock or be it the bands in the seam in that mining area?-- I have seen sparks from miners picks, yes.

You have, so there is a potential for incendivity from those

rocks as evidence by sparking from picks?-- Yes.

EXAMINATION:

MR ELLICOTT: It's my understanding that 512 Panel was the only panel at No 2 Mine where the bottoms were extensively taken; is that the case?-- Well, there were other areas in the mine that had similar bottoms taken out of them.

As extensively?-- I don't know exactly to what extent they did take the bottoms in 512, I'm afraid.

The rest of my questions relate to coal quality you will be relieved to know. I'm wondering if you can tell me to what extent coal quality influenced decisions whether or not to take bottoms?-- No, it was a very important part, I think, of the mining sequence, if you like, to - the decision whether to take bottoms or not was largely based on the quality of that coal.

And what aspects of the quality were primarily figured in the -----?-- The main feature was the ash. Bottoms are normally very high ash depending on the areas being mined at that particular time, whether that high ash coal could be diluted with other areas of lower ash coal or whether it wasn't possible to mine that because of that reason.

Was sulphur a consideration?-- Sulphur, no.

Not at all?-- No, sulphur from underground, very acceptable, .3, .4.

And that's right throughout the whole seam section?-- Around the underground, yes.

Including the bottoms?-- Yes.

No further questions, thank you.

MR CLAIR: I have no further questions, Your Worship.

MR MARTIN: I would like a question possibly by leave.

WARDEN: Thank you, by leave.

CROSS-EXAMINATION:

MR MARTIN: Mr Draheim, I think you've told Mr Harrison, I think it was Mr Harrison, that after the sealing and before the explosion you smelled from 512 borehole a bitumeny smell; is that right or not?-- That was the borehole that was drilled after the first explosion, yes.

After the first explosion?-- Yes.

I have no further questions.

CROSS-EXAMINATION:

MR MORRISON: You mentioned to Mr Ellicott the low sulphur content of the coal underground at No 2, do you remember that?-- Yes.

It was much lower than the coal at the open-cut, wasn't it?-- Well, there are areas to the south in the open-cut where we have higher sulphur contents, yes.

Was a lower sulphur content of the underground coal one of the things you took into account when you talked about its propensity or low propensity to spontaneously combust?-- Yes, it was.

I have nothing further.

WARDEN: Thank you, gentlemen. We might take five minutes before we start the next witness. Thank you, witness, you may stand down. You are excused.

WITNESS EXCUSED

THE COURT ADJOURNED AT 3.09 P.M.

THE COURT RESUMED AT 3.27 P.M.

MR CLAIR: May it please Your Worship, I call David Charles Kerr.

DAVID CHARLES KERR, SWORN AND EXAMINED:

MR CLAIR: Your full name is David Charles Kerr; is that right?-- That's correct.

Mr Kerr, you are the Superintendent at the Moura Mines Rescue Station?-- That's correct.

You are also the Acting State Manager, or perhaps now State Manager?-- No, not at the moment.

Were you at one point Acting State Manager of the Queensland Mines Rescue Brigade?-- That's correct.

That was last year?-- Yes.

In September?-- Yes.

Do you have any capacity in respect of the Queensland Mines Rescue Brigade at the moment?-- Yes, I am the Superintendent of the Moura station, also the Deputy State Manager.

You are the Deputy State Manager?-- Yes.

Now, you started in the mining industry in 1965 at Burgowan?-- Correct.

As an apprentice electrician at that stage?-- Correct.

You moved to Sirius Creek No 1 in 1969 as a miner?-- Yes.

And then to No 2 at Sirius Creek in 1971?-- That's correct.

You were appointed a deputy while you were at Sirius Creek and, as far as you recall, that was in 1970; is that so?-- Yes.

Now, there were two explosions at Sirius Creek No 2 Mine in 1972 and after that you joined the Mines Rescue Brigade?-- That's correct.

From 1972 to 1974 you worked at Laleham No 1 Colliery?-- Yes.

In 1974 you were appointed as an Assistant Superintendent at the Blackwater Mines Rescue Station?-- Yes.

And in 1976 as Superintendent at the Moura Mines Rescue

Station, and you have stayed there ever since?-- Correct.

In 1975 you gained the Second Class Certificate of Competency, Queensland, and the First Class Certificate in 1979; is that so?-- That's correct.

Now, as a Mines Rescue Superintendent you have a series of duties. One of those is to train members of the Mines Rescue Brigade?-- Yes.

To provide and maintain the necessary equipment?-- Yes.

To maintain the Mines Rescue Station to a standard where there can be an immediate response in an emergency situation?-- Yes.

And you have also a responsibility of educating potential mine deputies so they can gain their qualifications?-- That's correct.

That's a TAFE course; is that right?-- Yes.

And you have been charged with the responsibility of running that TAFE course?-- Not any more.

Not any more?-- No.

You were for a time?-- For a time, yeah.

Over what period of time was that?-- Probably nearly all the time I was at Moura, yeah, but we done the last course in about 1992, I think it was.

You did the last course?-- Yes.

In 1992?-- Yes. It's now run through the new Mineral Industries Study Centre in Rockhampton.

I see, okay. Well now, when you were running the course, it was done for the whole of that time under the auspices of the TAFE college; is that so?-- That's correct.

And was there a specific curriculum set down?-- Yes.

Did you always teach in accordance with that curriculum?-- Yes.

And were there specific examinations that the candidates sat for?-- Yes.

Administered locally by you?-- They were set by TAFE.

Set by TAFE but administered by you?-- Yes.

You brought some documents with you today just to give an indication of the extent of the syllabus in that TAFE course; is that right?-- That's correct.

Just have a look at this bundle of documents, if you would.

They are the ones you brought with you?-- They're the ones.

Now, the top three of those, are they syllabus documents?-- No, that's a bit of course material in the first - that's the syllabus document.

There is a course syllabus?-- Yeah.

Let's put that one on top so we know what we are talking about. The next one down is some of the course material?-- Course material, yeah, the next two down.

Just before you go to the last one; that syllabus, does that have a year date on it?-- Yeah, I see 1988.

1988?-- Yeah.

Did the syllabus remain the same from year to year or was it changed, updated?-- No, I don't think that syllabus would have been changed.

You would have still been teaching according to that syllabus in 1992?-- Yes.

And then the course material, the next two documents, do they have year dates on them?-- No.

They don't. Are you able to say when they would date to? Is it relatively recent material?-- No, that one is the original one.

That's the one that has "Teaching Correspondence School"?-- "Technical Correspondence School".

Sorry. How far back does that go?-- That was the original material supplied by TAFE.

Back in -----?-- When we started at Moura in 1976/77.

So, that's pretty old material, that one?-- Yes, that's an old one.

The next one, that has "MDS", I think, "004" on it?-- That's right, yeah, that's the upgraded one.

When would that date?-- I can only say some - probably that one there, 1988.

Well, the final document of those four documents then is an exam paper?-- That's right.

And what year is that?-- There is no date on that one.

Are you able to say when that would date?-- No, I couldn't remember when that was.

Just some time between-----?-- Some time, yeah, probably past 1988.

Some time between '88 and '92?-- '92.

That exam paper is the exam paper that people would sit for to gain their qualification as a mine deputy?-- That's correct, or one - if you don't get a qualification from this, there is another step in the process, yes.

It is one of the steps in the process?-- Yes.

How many exams do people sit?-- Just the one written examination.

Just the one?-- Yes.

There is one written examination?-- Yes.

What are the other features that enable qualification?-- On satisfactory completion of that one, they are then required to do an oral examination with a mines inspector and then he'll make a recommendation to the Board of Examiners to either supply a ticket or certificate or not.

So, basically the two steps?-- Yes.

Written examination, oral examination and assessment?-- That's right.

Can you bundle those four documents together? I will tender those as one exhibit, Your Worship.

While they are being marked - you may need to get them back to get some assistance - but what sort of thing was taught to mine deputies as part of their course, or potential mine deputies, aspiring mine deputies, as part of their course in relation to spontaneous combustion?-- The syllabus basically was what was supplied in the course material, plus extra that I put in myself.

If you want to relax a bit, you can sit back from that microphone. They are fairly sensitive ones, so don't feel you have to lean forward and speak into it, or you will end up with a stiff neck, Mr Kerr. Was it limited to what's set out in the syllabus?-- No.

So, there was some teaching beyond that?-- Yes.

Was there any practical side to the teaching in respect of spontaneous combustion?-- No, it was all theory.

It was all theory?-- Mmm.

There was at some stage a change in emphasis from - well, let me just prefix this by saying this: that one of the features that would be relevant to the identification of a problem with spontaneous combustion would be the production of carbon monoxide; is that right?-- That's right.

There was a change at one point from concentrating on measuring carbon monoxide in terms of the parts per million that might be present, to using that in conjunction with other measurements in order to ascertain the CO make - that's the rate of production. Now, first of all, that's obviously something that you would have been aware of as a part of your administration of the course?-- Yes.

Did that occur prior to 1992 when you were still teaching the course?-- Yes.

And to what extent was that reflected in what was taught to the aspiring mine deputies?-- Everything about CO make was taught to all the deputies.

You say everything about it. Can you briefly say what that entails?-- Well, the difference between using parts per million and calculation of absolute volume to give the indication.

And were they told much about the way in which one would measure the litres per minute?-- Yes, they were all taught how to calculate it.

I suppose there might be different ways to do it, but what was the most common way to ascertain the CO make?-- By use of - well, one or two formulas.

Just briefly explain those. What sort of information would you need?-- You would need the CO measurement, in either parts per million or expressed as a percentage by volume; you would need the air quantity flowing in the roadway and then a use of a constant either to multiply or divide the equation.

The air quantity would be measured via-----?-- Yes.

-----what means?-- By obtaining the velocity in the area of the mine roadway.

Using an anemometer?-- Yes.

Was that the only method?-- Yes.

So the anemometer reading would be essential to this method of calculating the CO make?-- Yes.

And the constant, I suppose, at least for calculations at a particular point, would be the area of the roadway?-- Yes.

At that point?-- Mmm.

That is, a section of the area-----?-- A cross-sectional area.

Okay. Well, was that the way that was most commonly - or the manner that was most commonly adopted?-- Yes.

For calculating CO make?-- Yes.

The deputies then - well, when would this change have come about?-- From memory, I think it was about 1987.

Were the candidates doing the course then instructed in how to take anemometer readings?-- Yes.

And were they instructed in how to actually carry out the calculation?-- Yes.

That's assuming that they had the cross-sectional area?-- Yes.

Was there any other method to calculate the CO make?-- That's the only one I ever used.

That's the only one you ever used?-- Yes.

The measurement of the wind velocity using the anemometer, was that a difficult task or an easy one?-- It is a precise task. You have got to take the time and do it properly to get an accurate reading.

We have been told the method involves moving the anemometer in a predetermined way across the cross-section - doing that for a specific length of time-----?-- Yes.

-----in each case, and doing three readings and taking an average so as to overcome any inconsistencies?-- Yeah, that's the standard method.

Of course, if the anemometer wasn't held at right angles to the direction of the wind flow, that could affect the reading; is that right?-- Yes.

If it wasn't moved in the proper manner across the whole of the roadway, that could affect the reading?-- Yes.

And I suppose if it wasn't moved for the appropriate period of time in each case, again that could affect the reading?-- Yes.

The read-out on the anemometer was a digital read-out; is that so?-- No.

Not a digital read-out?-- No.

How was that read out?-- Basically the one we use is a pointer on a circular scale.

Right. That anemometer reading would be used in conjunction with the - if you were calculating the CO make, used in conjunction with the reading in parts per million of the CO at a particular point?-- Yes.

The most common way of measuring that was by way of use of a Drager tube?-- Yes.

Either high range or low range Drager tube?-- Yes.

The low range would give more accuracy if you were operating within the low range; is that correct?-- Usually you would find there was not much difference between the high and low range tube.

The calibration on each was different?-- Yeah - the scales.

Would the low one enable you to read with more precision the point which the colour has reached through the crystals?-- That's so.

I want to come to that. Was there any particular instruction given as to just how the Drager tube was to be read?-- Yeah, everyone had practical experience with reading Drager tubes.

And the basic method with the Drager tube is that it's - the reading is taken and when the sample is taken into the tube, it causes a colouration in crystals that moves down the scale; is that so?-- Yes.

And, of course, that means that towards the bottom of the colouration, the colouration fades out?-- That's right.

To the point where it is no longer visible?-- Yes.

There seems to have been at least some controversy about the point at which the reading is taken. What instruction did you give as part of your course?-- Read to the lowest point of colour change - lowest point of visible colour change.

Right to the end-----?-- Of the stain.

-----of the stain?-- Yes.

Even where it is about to fade out?-- Yes.

Not just to the bottom of where you might get, say, solid colour?-- Not to the point of deepest colour penetration.

And there could be some significant difference between reading to the lowest point of deepest colour penetration and reading to the point where the colour fades out?-- Yeah, on some tubes there is a fair bit of difference.

And that, in turn, of course affects your CO and parts per million reading and, in turn, could have quite a substantial effect, depending on the wind velocity at the time - quite a substantial effect on the calculation of CO make in litres per minute?-- That's right.

Did you find as an instructor dealing with individuals that you would get a variation in the individual's assessment of what a particular reading was on the same tube?-- After shown how to do it - yeah, initially everyone has that different perception of where to read to, yeah. It is an inherent problem with that type of gas measurement, but, you know, with proper instruction, you read to the lowest-----

They get better and better?-- Yes.

But there might then be some natural limitations, I guess. One person's eyes might be better than another?-- Exactly.

Where you might be able to see colour fading out, with my eyes I might not be able to see that colour fading out and I might take a point higher than you?-- Exactly.

It could be affected by whether or not I wear spectacles and whether I wear them at the time?-- Correct.

I might see better at close range with spectacles, and if I don't use them, obviously I am not going to see as well when using a Drager tube-----?-- Yes.

-----as I would do if I had them or if somebody with perfect sight might do?-- That's right.

So all these features come into it?-- Yes.

But let me ask you this: is that the best way that's available of getting a CO reading in parts per million, or not?-- At that time it was, yes.

Now things have improved. When you say "at that time", going how far back?-- Up to the last deputies' course done.

1992?-- Yes.

Have things improved in terms of reading CO and parts per million?-- Yeah, there is an electronic digital read-out instrument available now.

What's that called?-- The one we have is called a Drager Multiwarn.

Multiwarn?-- Multiwarn, yeah.

And there can be no argument about the reading there because it is a digital print-out; is that so?-- Yes, but with a digital type instrument, in a general body situation where you have got turbulent air flow, the instrument probably will fluctuate between - say if you were reading 5, it might go to 5/6, 5/6, something like that.

But if you are standing there with the instrument, the fact is that everybody would see the same thing?-- Yes, you would see 5/6, 5/6.

You don't have that subjective element-----?-- No.

-----that we have spoken about with the Drager tubes?-- Mmm.

Now, does the Mines Rescue station have one of those Multiwarns?-- Yes.

Do you know if one of those was kept at the mine back in August of last year?-- No, the mine didn't have one, I don't

think.

When did they become available?-- We have had that one probably beginning of 1993, or maybe - no, probably - during 1992, I would say.

During 1992?-- Yes.

Well-----?-- From memory.

Well, as the Mines Rescue Superintendent, have you ever made any suggestion to the mine that they should employ the use of the Multiwarn, rather than the Drager tube to measure the CO?-- No.

Would you think that it would be a more desirable method of measuring the CO?-- You know, there are advantages and disadvantages of any type of gas detecting instrument, yeah. It is a matter of personal choice.

What are the disadvantages of the Multiwarn?-- The disadvantages of the Multiwarn - firstly, it is battery powered, so therefore the battery can go flat. It has a warm-up time before you can use the instrument.

How long is that?-- 10 minutes.

10 minutes?-- 10 minutes. For an accurate measurement, you have got to calibrate the thing every time before you use it.

What do you calibrate it against?-- A span gas.

A span gas?-- Yes. With that particular measuring principle, it is subject to corrections in the reading due to pressure differences.

Corrections that can be made on each reading?-- Yes.

You can calculate the correction that has to be made to the reading according to what, barometric pressure?-- Yes, or changes in ventilating pressure.

I see?-- Yeah, that would be about the disadvantages, I would think.

You say there would be a lot more trouble using it, particularly if it was to be used as a matter of course for every reading that was done?-- Yes, there is a bit more rigmarole to go through before the thing is available to give you a reading, yeah.

On the other hand, if there was a situation where there was a bit of concern about a CO reading being a bit higher than it should be, for instance, or if there was some controversy or disagreement about what the CO level was at any particular time, it's the sort of instrument that could be employed usefully to give a more accurate reading?-- It would compare - give a comparison to whatever reading you were talking about, yeah.

Would it advance you to the extent that at least you would have a reading that can be read as a certain figure rather than as subjective, that is dependent on how somebody might read the Drager tube?-- A Drager tube will give you a very, very accurate reading if you use it properly and read it properly.

The other instrument is not subject to that sort of qualification?-- No.

I've asked you about the way in which mine - or candidates for the examination as a mine deputy were trained. What about those people that were already deputies and had been deputies for some considerable time and also then other miners at the mine, experienced miners, who needed to be updated on their information? What system was in place to advance their training as far as the Mines Rescue -----?-- I wasn't involved with any refresher training.

Did you have any role in relation to training at the mine?-- We used to assist with induction training for new employees.

So they were people coming in as new miners in effect?-- Yes, new tradesmen.

No system to upgrade the deputies' state of knowledge?-- I had no involvement with that.

As far as you were aware?-- No.

Or at least that you were involved with, I mean?-- Yes.

In teaching the course with a view to the candidates for the deputies' exam you use that material that's already been admitted as an exhibit. There were also people, of course, who were members of the Mines Rescue?-- Yes.

And were there training courses for them within the Mines Rescue context?-- Yes, they would have completed the standard induction training course.

That's into Mines Rescue?-- Yes.

Induction into Mines Rescue?-- Yes.

So before they actually became a fully accepted member of Mines Rescue they did an induction course?-- Yes.

Was there anything taught about spontaneous combustion as part of that?-- Yes.

And you taught that?-- Yes.

Out at the Moura station?-- Yes.

What about after they became inducted members? Was there ongoing sort of updating of their state of knowledge and information?-- Yes.

Were there also other ways in which the state of knowledge could be extended or tested by way of competitions, that sort of thing?-- Yes.

How many of those? Many of those sorts of thing?-- One or two a year.

One or two a year? And again were you principally the person who did the training or imparted your knowledge to those people -----?-- Yes.

----- who were upgrading their knowledge, but only as part of that Mines Rescue activity; is that right?-- Yes.

Now, in doing that did you rely on material in the TAFE course and then other material that you had?-- That's correct.

Did you bring some of that other material along today too?-- Yes.

I will just get you to look at this bundle of material here. Just have a look at that, and if you could just read the name of the publication, we will deal with them one at a time. The top one is a red book?-- Spontaneous Combustion - Underground Coal Mines by Howard Jones.

I think we have already got that one in evidence here. It's been referred to as the little red book?-- That's right.

That's a well accepted piece of literature for people to learn about spontaneous combustion?-- Yes.

The next one there is the little blue book?-- Correct.

Does that pre-date the red book or post date it?-- Same time.

What's the difference between the two?-- The blue book is - has a little bit more technical information than the red one.

What's the name of the blue one?-- Spontaneous Combustion - Underground Coal Mines.

Again by Howard Jones?-- Yes.

But that's a blue one rather than a red one and it's a bit thicker?-- Yep.

Again we have got the blue one in evidence here already. the next document?-- Proceedings of a Seminar on Mine Fires, Brisbane, Queensland, conducted by the Australian Institute of Mining and Metallurgy.

Is there a date on that?-- 1973.

That's a book that you've had in your possession and which you have used to - I mean earlier in the piece at least, to improve your own knowledge on spontaneous combustion?-- Yes, and get material out of it.

The next document there?-- Ignitions, Explosions and Fires by A J Hargraves. It's also proceedings of a seminar, again by the Australian Institute of Mining and Metallurgy.

That's got a fair bit of technical information in it; is that right?-- Yes.

It's effectively a text book - or at least the proportions of a text book; is that so?-- Yes.

Again that's one that you use for your own - is there a date on that, I'm sorry? I don't know whether I asked you that?-- I suppose there would be somewhere.

Just perhaps on the -----?-- Yeah, May '81.

So that's been around for a time too?-- Yes.

That contributed to your knowledge which in turn you used to train people?-- Yes.

The next document?-- Flammability of Mixed Gases in Mines, Professor D Rowlands, Department of Mining and Metallurgical Engineering, University of Queensland, June '81.

And the next document?-- Same author, and area responsible, Spontaneous Combustion of Coal.

That's just a series of pages; is that right?-- Yes.

It's not a book or anything?-- No, no.

What date is that one?-- Looks like 1975.

The next one?-- Australian Coal Industry Research Laboratories Limited, The Prevention and Control of Spontaneous Combustion.

A date on that?-- It was received at the mine, by the look of it, in 1980.

Again that's a series of pages?-- Yes, it's just a -----

Photocopied pages?-- Yeah.

The next one?-- Report on the 17th Annual E K Healy Cup held on 8 August 1987.

Was that one of these competitions that you've referred to -----?-- Yes.

----- that people can go into. What area does it deal with?-- That's the whole aspect of everything we do in Mines Rescue they would be tested on there.

Not specifically spontaneous combustion?-- No.

Does it have any aspect such as on spontaneous combustion?-- There would have been in this one, that's why it's here, I guess. Yes, there it is. The team members were required to calculate - they were given a doorway with a fan running in it and they were required to calculate the air passing through the doorway then give it a parts per million reading and they were required to calculate the carbon monoxide make in litres per minute.

This was the beginning of the move towards looking at CO make in litres per minute?-- Yeah, 1987, I guess that would be about it.

The next document?-- That's another report on the E K Healy Cup.

What year?-- 1990.

Again would that have some aspect in it in respect to spontaneous combustion?-- Yes, it was, the underground exercise was based on spontaneous combustion and changing gas analysis readings.

These E K Healy Cup competitions, would that just involve a selected team from each Mines Rescue station?-- From each station, that's right.

So that it was - what should I say, at least in that area the elite deputies, I guess -----?-- Not necessarily, no.

----- or miners?-- Yeah, composed of any brigade member, yeah.

When I say "the elite", those who showed themselves worthy of getting into the team?-- Yes, yeah, or who wanted to.

Who would be involved in the competition?-- Yes.

The next document there?-- Colliery Managers' Association of New South Wales, Proceedings of Symposium, Dangers Associated with Fires in Mines, 7 August 1976.

So that's one that's been around for a time too?-- Yes.

And the final one?-- Mining and Ventilation Practice in Coal Mines Liable to Spontaneous Combustion by David Humphreys and

Andrew Richmond. When does that date?-- There is no date on that one.

Not a date on the publication page?-- No, I just forget when this one came into the industry.

You can't particularly recall yourself. Is that one that you used?-- Yeah, yep. In addition to that, the two - no doubt you have seen the books by Jim Strang and Paul MacKenzie-Wood.

There are some books already in evidence here -----?-- Yes.

----- that have been produced?-- Yes, the first and second editions also were used.

Your Worship, if that second bundle of material can just be separated there from the documents that were tendered earlier, I don't know that - given there is some duplicated material there and some that has perhaps been around for some time now, I don't know that I will actually tender those and burden the record, but can I say that they are there if anybody at the Bar table or the members of the panel wanted to consult them before Mr Kerr finishes his evidence? I am quite happy to tender them if the panel wants to receive them.

WARDEN: Can we mark the course content Exhibit 147 and the last bundle of books you refer to as Exhibit 148?

ADMITTED AND MARKED "EXHIBIT 147"

ADMITTED AND MARKED "EXHIBIT 148"

MR CLAIR: Thank you, Your Worship. Mr Kerr, basically from that second bundle of documents then and from other sources too, no doubt, you acquired the knowledge that you imparted to candidates for mine deputy and also to those other people being trained in association with Mines Rescue?-- That's correct.

Can I just ask you this: what sort of importance did this aspect of spontaneous combustion - this matter of spontaneous combustion assume in the training both of the deputies and the Mines Rescue people?-- No more than anything else, just another part of the syllabus.

Another part of the syllabus. There wasn't any specific concentration on it?-- No.

At the same time it was there as part of the course?-- Yes.

It wasn't ignored altogether?-- No.

Now, you've made an effort yourself in your position as Mines

Rescue superintendent to keep up-to-date with the underground mining operation, particularly in your area; is that right?-- That's correct.

You would take opportunities to look around the mine, in particular Moura No 2? You would go there; is that right?-- Yes.

And were there occasions when you were called in in order to discuss a particular aspect of the operation of the mine? Did that sort of thing happen?-- No mining operation, only more abnormal circumstances.

Abnormal circumstances related to safety?-- Not so much safety, but - I suppose it's safety in the end, yeah.

Perhaps you can explain that?-- Well, what I was involved with was usually inspections of waste areas.

Inspections of waste areas?-- Yes.

They are areas where dangers can grow?-- Yes.

Is that right? Okay. I think you said in the statement that you made for the purposes of this matter that you would have visited most extraction panels over the years?-- Yes.

And inspected waste areas, specifically to check on the ventilation of the waste area?-- Yes, and also for the production of carbon monoxide.

With a view to determining whether there is any sign of spontaneous combustion?-- Yes.

On these occasions you would always be accompanied by a mine official?-- Yes.

I suppose you've been aware of the sealing of most of the panels -----?-- Yes, I would have been.

----- in Moura No 2 over the years?-- Yes.

Was there one in particular, that's the sealing of 5 North panel, in which you became particularly involved?-- Yes.

More closely involved than others?-- Yes.

What were the circumstances of that?-- A heating had been identified.

And how did you become aware of that?-- I was notified by the - it was the acting manager at that time.

Yes, and did you go to the mine?-- Yes.

And what happened there?-- Basically the situation was assessed and a decision made to seal the area.

Do you remember when this was?-- In 1986.

1986?-- Yes. April, I think.

April 1986?-- Yeah.

John Brady was the mining inspector at that time too?-- Yes.

Was he involved in the proceedings that day?-- Yes.

Now, do you recall just what indicators there were of there being a heating in the panel?-- Rising CO parts per million measurements.

Do you remember figures now yourself or is that asking a bit much?-- I think the first one was 12 or 13 at about seven o'clock in the morning, yeah, and it rose fairly sharply from then until the section was sealed in the afternoon about five o'clock.

You don't remember what level it had reached at that stage?-- Yeah, it was at 150 ppm.

What stage were you called in on the basis that there looked to be some sort of problem? Was it long after seven o'clock or around seven o'clock?-- I can't remember at what time the phone call came.

During the morning?-- It was in the morning, yeah.

It was during the morning?-- Yes.

Do you remember what level the readings were in parts per million when you were called in?-- No, not without looking at some literature on that.

But it grew, you say, fairly rapidly during the day; is that right?-- Yes.

If I suggested that some notes that were made at the time, a history as it were, or a summary of the sealing, indicated that at nine o'clock in the morning there were 13 ppm in the general body, at 10.30 some 20 ppm at the vent station, and 40 ppm at the goaf edge of CO, and that it was about that time that you were contacted, would that accord with your memory? That's not inconsistent anyway with what you recall?-- No, that would be right.

Then the level of CO continued to rise, as you say, throughout the day?-- Yes.

The goaf edge a bit after half past five in the afternoon showing 120 ppm?-- On the goaf edge, yeah.

So that fits with your memory of things. So would you regard that as a fairly clear case of there being a heating in the panel?-- Yes.

At that stage the idea was to look at the parts per million, not to be calculating the CO make?-- Yes.

That panel was sealed with all of the equipment inside and some months later was re-opened -----?-- That's right.

----- so that the equipment could be recovered?-- Yes.

As a Mines Rescue superintendent were you involved with the re-opening?-- Yes.

There were no difficulties with that?-- No.

Let me come forward then - well, let me ask you this: were there any other particular sealings of panels that you were involved in?-- No, that was the only one.

Did you have any association with the sealing of panels in No 4 at all?-- No, not that I can recall.

Were you aware of the practice in No 4 of the men being kept out of the mine after a panel had been sealed and while the panel went through the explosive range?-- No, I wasn't aware of that practice as a standard practice.

Perhaps I should ask you this: as a Mines Rescue

Superintendent, would that be a matter that you would be involved in?-- Not on -----

Would there be any discussions with you as to whether -----?-- Not on a normal sealing of an extracted panel.

Would you expect that if there was any danger, that there would be discussions with you to determine whether men should be kept out of the mine?-- More than likely I would have been notified, yes.

You would be notified that they were kept out or would you be consulted about whether they should be kept out?-- I can't say that for sure, whether the mine manager would have involved the services of the Mines Rescue or not.

I mean, there is Mines Rescue, but I think you have made it plain that it's also to some extent mine safety, that is, if you can prevent having to - prevent a situation where there might be a rescue element, that's better than waiting until it becomes a rescue situation; is that right?-- Certainly.

And that's one of the reasons that you would be involved in inspecting goafs and, in particular, looking for ventilation problems and spon com?-- Yes.

So that it wouldn't be outside that - at least the spirit of what you say in that connection for there to be some consultation with you if there was concern about whether or not there was some danger after the sealing of a panel?-- Probably.

Was there any occasion when you were consulted by mine management or by deputies?-- I can't recall any occasion during the life of the No 4 Mine, no.

That sealing of 5 North, there was no question there, the men were kept out of the mine?-- Yeah, for a 24 hour period following the sealing, yeah.

While the panel went through the explosive range?-- Yes.

And that's what you would have expected?-- Yes.

Because there was that fairly clear evidence of a heating which led to the sealing of the panel?-- Exactly.

Have you ever had to form a view as to what sort of signs you would regard as being sufficient evidence of a heating to take the step of ensuring that the men were out of the mine after a panel was sealed?-- No.

You have never had to confront that yourself?-- No.

That is, in terms of what - how many signs there are of a possible heating. Okay. Now, can I come forward to when 512 Panel was being extracted? You did visit 512 Panel?-- Yes, on one occasion.

And what were the circumstances of that?-- To re-check a high CO reading obtained during that day.

Were you actually contacted at the Mines Rescue Station -----?-- No.

----- or were you out at the mine for some other purpose?-- I was at the mine, yes.

How did you get involved with this aspect of checking the reading in 512, who approached you?-- I sort of run into the undermanager, George Mason, who mentioned, as I recall, something about this high reading, and we had a little bit of a talk.

Was it on the basis that he had been attempting to contact you in any event -----?-- No.

----- or was it just that he happened to run into you?-- Yeah, on that afternoon.

Along the lines of, "Since you are here, can you come and have a look at this?"?-- Yeah.

Okay. Were you given any information about readings that had been taken prior to his seeing you?-- No.

I mean, did he tell you what readings had been taken?-- What, during that afternoon?

Yes?-- The concern was the higher than normal CO reading obtained, yeah.

And that reading had been taken before George Mason saw you?-- Oh, yes, that was during the day.

Did he tell you what that reading was?-- Yes, it was 8 ppm, I think.

And had that involved some sort of increase over the previous readings?-- Yes, and in relation to what the Unor system was reading.

It was different to the Unor system?-- Yes, higher.

And who else was - you spoke with George Mason obviously?-- Yes.

Was there anybody else there at the time?-- Yes, Jacques Abrahamse.

And did Jacques have anything to say about it?-- Yes.

What did he say?-- He indicated that the - there was also a mistake made with the anemometer reading, and combining that with the higher than normal CO reading it produced a very high CO make, litres per minute, when it was calculated.

Did he actually tell you that there had been a CO make calculated on the basis of some wrong anemometer reading?-- Yeah, they had calculated it out at - I think it was 18 litres per minute, the figure, from memory.

You are quite sure about that aspect of it?-- Yes.

That he said that the final calculation of litres per minute was higher because there had been a mistake in the anemometer reading?-- Yes.

You have got no doubts about that?-- No, plus the higher CO reading.

Plus the higher CO reading?-- Yeah.

Well then, what did he ask you to do in relation to it?-- The context of the conversation was that it was abnormally high and it was probably due to these two factors.

The two factors?-- Yes.

That is higher than usual CO in parts per million, plus the wrong anemometer reading?-- Yes.

Did he say who had taken the readings?-- Yes.

Who was that?-- Steve Bryon and Peter Rose.

Steve Bryon at that stage was the acting ventilation officer?-- Yeah, he was doing vent surveys.

Stepping in for Cocky Morieson?-- That's right.

What resulted from your discussions?-- That the reading be re-checked.

It was a Friday; is that right?-- That's right.

Tell me whether or not you were aware of this, but each Friday the ventilation officer used to do a calculation of the CO make in litres per minute; is that right?-- I wasn't aware of that, no.

You weren't aware of that?-- No.

Did you see a graph?-- Yes.

That had been plotted with this high reading on?-- I saw several graphs.

You saw several graphs?-- Yes.

First of all, was there one that had been plotted with the high reading on it?-- I cannot recall that specifically.

Well, what sort of graphs did you see?-- Graphs of CO make in other sealed panels, plus the one from the heating situation in 5 North.

In 5 North?-- Yeah.

Did you see a graph in relation to 512 at all?-- I can't recall specifically if I saw that one.

Do you think you saw a graph at any time that had this higher reading on it?-- I can't recall the specific graphs, no.

Of course, the purpose in keeping the graph was to see what the trend was; is that right?-- Yes.

And correct me if I am wrong, but that was because the actual reading in parts per million, or even the actual CO make, within limits, was not as important as the rate at which the CO make was increasing or the rate at which the CO in parts per million was increasing; is that right?-- Well, the trend and the quantity are both important.

Yes, okay. They are both important?-- Yes.

In terms of the CO make, if you did see a rapid increase in CO make, that would be a real concern?-- Yes.

It would be a real indicator of a heating?-- Probably.

Now, could the witness see Exhibit 21, please, Your Worship? Now, I don't know whether you have actually seen any of those pages before, but if it could be passed - perhaps if I can ask you to go to the fifth page from the back, Mr Kerr. That's really a collection of documents that you have got there, and I am sure that most of them you wouldn't have seen before. The fifth page from the back should be headed up "CO Make 512", "page 2" up in the top right-hand corner. Okay. Now, you will see there the first entry there is an entry for 22 July '94?-- Mmm.

And we are dealing with vent station 46; do you see that? Just moving across the line, the area, of course, is a constant at that point, and you will see the velocity recorded there of 1.77 - velocity in metres per second?-- Yes.

And then the wet and dry temperature, relative humidity, and if you go across to CO in parts per million you will see that figure of 8?-- Yes.

Which is the reading which you understood had been taken earlier in the day. Then there is a total CO make in litres per minute calculated at 18.98 - I am sorry, perhaps in relation to vent station 46 I should draw your attention to the second last column which is 18.62?-- Yes.

And that's the CO make that was calculated using those figures, the velocity of 1.77 and the CO of 8 parts per million. Okay. Now, do you remember actually seeing that document or a document like it that day when you were -----?-- No, I don't recall this specifically.

But certainly the figure of 8 parts per million rings a

bell?-- Yes, and the 18.

And the 18.62 would be consistent with what you remember?-- Yes.

Now, you said that you were told that 18.62 resulted from two errors that had been made; one being - or two possible errors; one being the reading of 8 ppm, the higher than normal reading, and the other being the fact that the wrong wind velocity had been recorded?-- Yes, that's how I understood it.

You have got no doubt about that?-- No.

You see, what I want to suggest to you is that the wind velocity which is recorded there, the 1.77, was in fact correct, that there had been an error initially in noting the wind velocity but that that was corrected before there was any CO make calculated in the morning when these readings were taken?-- Right.

Now, in fact if that's so - and there seems to be no dispute about it - what you had was a reading of 18.62 resulting from all figures that were quite acceptable except for the 8 ppm of CO. Now, the 18.62 would be particularly concerning, wouldn't it?-- Yes.

Both in terms of quantity and, as I will demonstrate to you, in terms of the rate of increase in CO. Could the witness see Exhibit 93, please, Your Worship? I'm sorry, perhaps I am jumping ahead by putting both those things to you, but certainly in terms of quantity itself 18.62 would be a worry?-- If you use the standard parameters of between 10 and 20, yeah, it's getting high.

At 10 you would want to keep an eye on it, I suppose you would say?-- That's the standard, yeah.

And as it approaches 20 you know you have got a problem on your hands; is that so?-- Yes.

Just have a look at that Exhibit 93, and what you will see there is an unusual sort of graph because the bottom points that have been plotted on the graph are not all equal periods of time, but at least as we approach that date of the 22nd they are weekly readings, you see? Now, we come to the 15th and then there is one arm of the graph that goes up to a point consistent with that 18.98?-- Yes.

Which results basically from that figure of 18.62 plus the small amount coming from vent station 59 on that other document that you have got there. Now, of course, if the graph was representative of the real situation, that would be the sort of graph that you would be worried about in terms of the rate of increase in CO make?-- Yes.

In litres per minute. Did you see that graph when you were there that day?-- I can't specifically recall that I saw that graph.

You don't recall seeing anything with a question mark on it?-- No.

You will note that the actual continuation of the graph is plotted down to another reading on the 22nd, is that right, which is a reading of about 14 - actually 13.7, consistent with a reading of 13.7; is that so?-- Yes.

I will come just in a moment as to why that's 13.7, but you will see that the graph isn't plotted on from the high point, it's plotted on from the lower point on the 22nd. Now, you have got no memory at all of any graph like that even?-- I can't specifically recall that, no.

Now, just coming back to what actually happened then on that afternoon, the first thing that was of concern was this reading of 8 ppm?-- Yes.

And what was it suggested that you would do in relation to that?-- Go and verify it.

Did you do that?-- Yes.

You went down to 512 at that stage?-- Yes.

Who with?-- Jacques Abrahamse and Terry Atkinson.

What sort of equipment did you take down with you?-- We took Drager tubes, high and low range, and the pump, of course, and the anemometer.

There were no actual low range tubes in stock at the mine; is that right?-- No.

You went and got some yourself?-- I went and got some.

You and Jacques, Terry Atkinson, the shift undermanager -----?-- Yes.

----- went down. Where did you go down there?-- To the vent station in the top return 512.

Was that just around the corner? When you say "in the top return", was it actually in the top return or was it around the corner from the top return?-- No, we took the readings in the top return inbye the prep seal.

I wonder if you could just stand up and turn those two front maps over and you will see behind there a plan of 512 Panel. Just familiarise yourself with it. If you haven't been there much, you might not remember it, but you see the No 1 cross-cut there? That will give you an indication of where it starts. Zero cross-cut in fact is the continuation of the top return in 510 Panel?-- That was the site for the prep seal, and we took those readings just inbye that.

Just inbye that prep seal in the top return?-- Yes.

Was there any suggestion of there being a vent station around the corner where you see that red dot in the No 1 road of 510?-- To my knowledge, that was the vent station.

To your knowledge, that was the vent station?-- Yes.

I'm sorry, which was the vent station?-- Where we took the readings.

You weren't aware of any vent station around the corner?-- No.

Where that red dot appears on the map?-- No.

Outbye of the top return?-- No. I thought we were at the vent station.

Well, you were just inbye the seal. Was there a prep seal there at that stage?-- Yes.

And whereabouts was the actual reading taken?-- Probably a metre, two metres in front of the prep seal.

And in the middle of the roadway?-- Yes.

What height?-- Mid-body height.

Mid-body height?-- Yes.

How many readings were taken?-- One on each tube.

How many tubes then?-- Two.

Two tubes?-- Yes.

One on the high, one on the low?-- Yes.

And both tubes showed?-- 5 ppm.

And about what time of the afternoon was that?-- That may have been about 5.30, something like that, from memory.

Was there also a wind velocity reading taken?-- Yes.

And who took that?-- Jacques. Jacques Abrahamse.

Then the calculation was subsequently made of litres per minute?-- No.

You weren't party to that?-- No. The calculation wasn't made under me.

Did you feel comfortable about the 5 ppm?-- Well, it was consistent with the Unor reading again.

Did you know where the Unor points were?-- No.

You didn't? Did it concern you at all that there had been a reading of 8 ppm earlier in the day?-- Yes.

Did you know Steve Bryon very well?-- Yes.

Was he a member of your Mines Rescue Brigade?-- Yes.

Had he competed in the E K-----?-- He probably would have done at some time.

E K Healy Cup?-- Maybe not that one, though.

He competed at some stage?-- In competition, yes.

You didn't have any reason to doubt his capacity to read a Drager tube?-- No.

You really wouldn't have had any reason to doubt that he had correctly read the Drager tube that morning?-- No.

Was there any other reason then why you would have perhaps just put to one side the fact that there had been at least a report of a reading of 8 ppm earlier that day?-- No, any increase in CO reading or sudden increase should be treated with concern.

Well, what steps were you aware of that were taken here which indicated that that reading was being treated with concern? We know you went down to remeasure it?-- Yes.

Apart from that?-- What, prior to going down?

No, no, any other steps at all?-- I wasn't aware of any other steps that had been taken in relation to that high reading.

Did you suggest anything yourself that should be done in light of the fact that there had been a reading of 8 ppm earlier in the day?-- I think I established that had it been checked at the point when I was in the office there.

But that was all?-- That was all, yes.

The only question you asked. And subsequently you did go down and did check it?-- Yes.

Of course, there is scope - or correct me if I am wrong - but there is scope, isn't there, for a variation in readings of CO between one point of time and another?-- Yes.

Even within the same day?-- Yes.

For instance, if there had been a change in atmospheric pressure between the morning when the reading was taken and the afternoon when the reading was taken, that would be a factor that might affect the amount of gas that was coming out?-- That's possible, yes.

In fact, it wouldn't be unusual to have an increase in atmospheric pressure in the course of the day that might have quite a dramatic effect, in fact, in keeping gasses in the mine - in the panel, I should say?-- On a normal day, it wouldn't be - there is not much likelihood of getting a barometric change to the extent that it would cause gasses to be liberated from an extraction panel, given normal variation of the barometer on a day unaffected by storms or major temperature changes, or something like that, but it is not impossible.

Not impossible?-- No.

Is it also a factor that ventilation through a panel, particularly where you have a substantial goaf area with large areas of waste, might, on some occasions, move in such a way as to pick up what might be the results of a small heating, whereas on other occasions the ventilation might not pick that up?-- Change in the ventilation may flush out some residual CO2 that wasn't affected prior to the ventilation change.

Was it a factor in your thinking that perhaps this 8 ppm reading wasn't of such great importance - well, at least the distinction between the 8 ppm earlier in the day and the 5 ppm later in the day wasn't of such great importance because even with the wrong anemometer reading, what it produced was a CO make of 18.9, at least as far as you had been told; is that right?-- Yes.

So, I suppose what I'm asking is this: is the fact that you were told that the CO make of 18 - at least 18.62 for that vent station - that the CO make of 18.62 resulted not only from the 8 ppm but from a wrong anemometer reading?-- Yes.

Was that a factor that helped you to dismiss it?-- I didn't dismiss the 8 parts.

No, at least helped you to dismiss what appeared to be a high reading in terms of the CO make; that is, the 18.62?-- Yes.

And in turn helped you to dismiss what appeared to be a difference between 8 ppm - a fairly substantial difference between 8 ppm earlier in the day then 5 ppm later in the day?-- Yes.

When you were there and after you had taken the readings inbye the seal in the top return, did you go further down that roadway?-- Yep. We walked in, I think, another four or five pillar lengths.

Did you take another reading down there?-- Yes.

With both tubes?-- Yes.

Readings?-- The same.

Both 5 ppm?-- Yes.

Did you notice anything else unusual when you were in there?-- I noticed nothing abnormal.

Did you then go to the work face?-- Yes.

And the machine was extracting bottoms at that stage?-- Yes.

And Reece Robertson was the deputy?-- Yes.

Did you have some conversation with him?-- Yes.

Do you remember what was said at all?-- We told him what we had done, and during the course of the conversation I asked him to keep an eye on the CO.

When you said that, did you say "keep an eye on it for this shift", or did you mean keep an eye on it for the future?-- I guess that shift and the future, yes.

You didn't specify-----?-- No.

-----one way or the other. Then after you visited another

section, you think 5 South, you went to the surface?-- Yes.

You had a conversation there with George Mason?-- Yes.

And what did you tell him?-- Basically where we had tested, what results we had got, that he indicated that they would be increasing the frequency of monitoring from that section, and that was it.

Did you tell him that you had had a look around down there?-- Yeah, walked into the - along the return, yeah. Found nothing abnormal. Told him the gas readings; that was it.

Was it George Mason who suggested that they would keep more frequent - or do more frequent monitoring in the panel?-- Yes.

And did you make any suggestion yourself along those lines?-- I think that was discussed before we even went down the mine.

Was it?-- Yeah.

At whose instigation?-- I can't recall.

Did you understand what was the frequency of monitorings at that stage?-- Weekly measurements, I believe.

Weekly measurements of CO make, that is?-- Yes.

I mean, obviously there would be a reading in terms of parts per million on each shift?-- I'm not aware of that.

Would that be part of the deputies' role?-- Probably.

You are not aware of that?-- I'm not sure, no.

What you are talking about is calculating litres per minute?-- Yes.

You understood that was weekly. Was it said just how frequently that might be done?-- As I recall, I'm not sure whether it was every shift - like, George said it would be done - every shift or every day.

Was there some discussion then of that being plotted on a graph daily?-- No, I left soon after that.

So, you don't know what might have flowed from that?-- No.

But the idea was that at least the readings would be taken, perhaps, you think, every shift, with the view to calculating CO make?-- Yes.

And the reason for that being to monitor closely the situation-----?-- Yes.

-----inside 512?-- Yes.

Because there had been this reading of 8 ppm?-- Because the

CO make was running higher than normal.

Did anybody tell you at any stage that there had been a slight tarry smell detected in that panel?-- No.

Back in the middle of June?-- No.

Or of a problem with layering in the No 2 roadway - a layer of warm air coming back up the intake road?-- No.

Nobody ever told you that?-- No.

Wasn't any discussion of that while you were there?-- No.

The following Monday, 25 July, you had occasion to ring a Mr Paul Mackenzie-Wood at the Southern Mines Rescue Station in New South Wales; is that right?-- That's right.

And that was basically to inquire about the progress of evaluation of some new Drager breathing apparatus; is that so?-- That's correct.

When you were talking to him, did you make mention of this matter?-- Yes.

In respect of 512?-- Yes.

What did you say to him?-- I can't recall specifically the conversation, but the context would be that basically there was an extraction panel with the CO make running higher than normal, but was also a new method of extraction that was being tried, which was basically exposing more coal faces and leaving more loose coal on the floor.

What else did you say to him?-- As I said, I can't recall specifics of the thing. But finally-----

Was there any discussion about the time that it had taken for the extraction?-- Probably I would have mentioned, yeah, it was only a short-term thing in relation to other panels, yes.

Did you say anything else about your inspection?-- Yes. That I'd been down the mine and I could see nothing abnormal.

And what did you say to him as to what was being done?-- That the situation was being monitored.

Did you have frequent conversations with Mr Mackenzie-Wood?-- No.

So, it wasn't as though you spoke with him every day?-- No.

And told him about every day events?-- No.

So, this was a matter which was sufficiently unusual, as it were, for you to mention to him specifically when you spoke with him on the Monday?-- I thought so, yes.

And you say that you said to him they were getting higher -

that there was a higher CO make than normal. What did you have in mind as a figure for the CO make when you said that to him?-- The figure in my mind was I - I had was 8 lpm.

8 lpm?-- Yes.

Where did you get that figure from?-- That's the figure when I went down - had in my mind that I arrived at from looking at the graphs on Friday afternoon.

8 lpm?-- Yes, around about 8 lpm average.

Have you got that Exhibit 21 there? That's the bundle of documents?-- Yes.

Just go back to the previous page. Go back a bit to the 10th of June, if you would - the previous page?-- Yes.

Sorry, no, that doesn't seem to be - it is the - you were at the 5th page from the back, so what I'm asking about is the 6th page from the back?-- The other way?

Yes, the other way. The previous page. That's right. You will see that's page 1 of the document described as CO make 512. See that?-- Yes.

If you go to that date, 10 June, you will see that the CO make of the 512 panel, by the time you take both vent stations 46 and 59, totalled 11.43 - over on the right-hand column, see that?-- Yes.

Total make. 11 June was 11.61?-- Yes.

16 June was down, 7.32, but then 24 June, that's up to 10.41, and then 12.22-----?-- Yes.

-----on 1 July. 8 July, 12.52; 15 July, 14.59?-- Yes.

And then if you were to take the first reading on 22 July, actually up to 18.98, but even on the second reading, it is at 13.7. That's the reading that is based on the 5 ppm that you took - 13.7. Now, all of those readings from 10 June forward are well above the 8 lpm that you spoke of as a CO make that was higher than normal. So, can I ask you this, first of all: were you shown these figures at any time?-- No, I didn't see those.

Or told about these figures?-- No.

11.4 going up to 14.6 almost?-- No.

What would have been your reaction if you had have known if the CO make in litres per minute were running at those levels?-- That's in the "what if" category, isn't it?

It is, but, you see, it is important, because we want to look at what kind of information should be imparted to what people in the context of the lead-up to this explosion, so that this kind of situation might be avoided in the future. So, can I

ask you the question again: what would have been your reaction if you had known that the CO make was up in that sort of region?-- Well, it was obviously within the area of concern between 10 and 20 lpm.

But you were never told-----?-- No.

-----about that. Did you feel comfortable with the situation that there was this monitoring, in effect, shift by shift - at least you thought it was to be shift by shift?-- Yes.

Of the CO make?-- Yep.

And it was on that basis, then, that you were content not to interfere any further?-- Yes.

If you had been aware that that monitoring, in effect, continued, at least by way of the readings - the CO make being calculated on a shift by shift basis, and then graphed on a graph - continued only until the middle of the following week, what would have been your reaction - in fact, probably only the Monday or the Tuesday of the following week - what would have been your reaction to that?-- That would have to be regarded as bad practice.

And as a mine rescue superintendent would you have been concerned about what was being done to monitor the situation?-- Yes.

Now, on that Monday that you spoke with Mr Mackenzie-Wood did you also ring the chief inspector of coal mines, Mr Brian Lyne?-- That's correct.

That was on a matter related to rescue brigade business; is that right?-- Yes.

And did you also have a conversation with him about what had happened at least about your conversation with Mr Mackenzie-Wood?-- Yes.

Can you remember now just what was it you said to Mr Lyne?-- Not specifically. All I could suggest is it would be what I related to Mr Mackenzie-Wood and the result of that conversation, and that the situation was being monitored.

You told him the situation was being monitored?-- Yes.

On the basis of more frequent readings?-- Yes.

Did you go to that point? I don't want to put words in your mouth?-- Yeah, it would be what George said, that it was - going to monitor it at a higher frequency.

I'm really just asking you what you remember, and I don't want to be suggesting to you what did take place, but rather get your best recollection of what took place, you see?-- Yes.

Well, did you have any further involvement at all in 512 Panel?-- No.

Did you ask anyone at any stage about what was being found with the more frequent monitoring?-- No.

Did you see the deputies from the mine very often, the fellows particularly who were in Mines Rescue? Did you see them very often?-- Normal training days, yes.

Was there any discussion amongst them about 512 -----?-- Not that I can recall.

----- in your presence?-- Not that I can recall.

Now, the next point in time when you did have involvement with 512, at least something in relation to 512 Panel, was on the night of Sunday, 7 August; is that right?-- Yes.

And can you tell the Inquiry what happened on that night?-- I received a phone call from Michael Squires, shift undermanager, at some time between 11.30 and midnight, I can't remember exactly what the time was, indicating to me that there may have been an explosion at the mine and could I come out.

And did you go out?-- Yes.

And what happened there?-- On the way out to the mine the first thing I saw was - well, you see the - go past the main ventilation fan. I saw what appeared to me to be smoke or dust issuing from one of the evasees. I continued on to the No 2 parking area. When I got out of the vehicle there was a distinct smell of afterdamp. There was quite a heavy dust haze in all the - around all the surface lights and I think I went straight in to have a look at the Unor monitor

Yes?-- Which showed high levels of carbon monoxide and methane.

The monitor was in what condition at that stage?-- It appeared to be functioning normally, yes.

Did it? The high levels of carbon monoxide and methane were being shown at, what, all the points that were registered there or - all the points on the monitor or some specific point?-- I can't specifically recall what figures were at what monitoring point, but there was in red in alarm mode the CO and the methane.

Across the board, not just at one point?-- I can't remember which point I looked at or if it was the whole lot or whatever.

Just before we pass on, the fan evasees, is that e-v-a-s-e-e-s; is that right?-- Yes.

It's just that the shorthand reporters know most of the mining lingo now, but I think that might have been one -----?-- First time, was it?

There aren't too many new ones left, that must be one of them. Now, you had contacted John Blyton on the way; is that right?-- Yes.

He arrived there too?-- Yes.

Shortly after you?-- Yes.

And what did you do then?-- Well, it appeared obvious that there had been an explosion at the mine and we began to initiate our call-out procedures to get Mines Rescue personnel to the mine.

Now, nobody had contacted you over the days leading up to 7 August with any reports of what had been found in 512 Panel?-- No.

Had you been made aware that the sealing of 512 Panel had been brought forward?-- No.

Of any of the circumstances surrounding the bringing forward of the sealing?-- No.

The kind of features that you would look for in ascertaining whether there was at least some grounds to suspect a heating

would be what?-- A heating or gas -----

In a panel?-- In a panel, extraction panel.

In an extraction panel?-- Apart from the CO concentration, CO make, there is smell and haze.

Had anybody ever told you that there had been what was described at one point as a strong tarry smell in 512?-- No.

On the Friday just before the - late on the Friday?-- No.

Before the explosion?-- No.

Benzene type smell?-- No.

A haze?-- No.

I mean you may have learned these things since the explosion, but I mean prior to the explosion?-- No.

There was no discussion of those things?-- From that Friday afternoon I had no involvement at all in 512.

That's 22 July?-- Yes.

If you had known those things, that is a strong tar smell and on another occasion on the Saturday, described as a benzene smell, a haze that was observed in the top return on the Saturday morning and readings taken on the Saturday, that would indicate that - first of all on the Friday, readings taken at 1.30 p.m. that would indicate a CO make of 14.27 for the 512 Panel - in fact they are on the front of that Exhibit 21 if you want to look at it - at 12.45 a.m. on the Saturday a CO make of 18.94, on - at 10.15 a.m. on the Saturday, figures taken which if calculated through to a CO make at that time would have indicated a CO make of 21.04. What sort of conclusion - if you were aware of all those things, on the Saturday afternoon after all that information had been assembled - at least become available but perhaps not assembled, what sort of conclusion would you have formed as a Mines Rescue superintendent?-- Well, obviously they are all symptoms of a - an established heating.

An established heating?-- Yes.

Not just a suspected heating?-- No.

But an established heating?-- Yeah.

And can I ask you this: if you seal a panel, from your own experience and - knowledge perhaps I should say, if you seal a panel and you have an established heating inside the panel, what consequences follow for the heating once you've sealed it, then what consequences follow for the heating?-- Normally the oxygen in the area is consumed, the CO will rise initially. Also if there is any methane make in the panel it will rise until you reach a situation where either the oxygen content is reduced below 10 per cent - 12 per cent, sorry,

which is below the explosive limit for methane or the methane rises through the explosive range plus 15 per cent. That would be the normal course of events.

But in so far as the established heating is concerned that would in time be deprived of fuel, I guess, as the oxygen is consumed?-- Deprived of oxygen, yes.

Is there any established way of measuring the rate at which that oxygen is going to be consumed?-- The normal method is to leave a sampling tube in behind the final seals.

Apart from actually having a tube in the area of the heating you wouldn't know just how long it would take for the oxygen to be consumed, would you?-- No, you would be guessing.

You would be guessing?-- Mmm.

So once the panel is sealed what you know is that the heating, the fire, will at some stage run out of fuel?-- It will run out of oxygen, it will be deprived of oxygen. There is plenty of fuel there, but it will run out of oxygen.

It won't continue to burn if it runs out of oxygen again?-- Providing the seal is perfect, yes.

As far as the fire is concerned it will run out of fuel?-- It will run out of one side of the fire triangle, yeah, oxygen.

At the same time the mixture of gases behind the seals will move towards the explosive range; is that right?-- Depending on the methane make, yeah, in a particular area, yeah.

But the normal thing would be that a panel will - having been sealed, will move towards the explosive range?-- Yes.

Now, if the panel moves into the explosive range before the fire runs out of fuel or runs out of oxygen you've got a problem; is that right?-- If the temperature of the heating is still sufficient above the ignition temperature of methane then the potential exists.

And what you've got then is the explosive mixture of gases?-- Yes.

And you've got the source of ignition?-- Yes.

Assuming that you've established heating?-- Yes.

Your fire is hot enough to ignite the explosive mixture of gases?-- Yes.

And an established heating would be more than likely sufficiently hot to ignite the mixture of gases; isn't that so?-- Difficult to say what temperature the thing would have reached at the time of sealing, yeah.

Again then it's one of those things that you are just balancing, you really don't know?-- No.

So that if you have an established heating and you seal a panel it's really a bit of a race between the fire going out, running out of oxygen on the one hand, hopefully before the panel moves into its explosive range?-- Yes.

Is that right? But if -----?-- Or if the methane make is high enough it will pass through the explosive range.

Pass through quickly?-- Yes.

But may pass through while the fire is still hot enough to ignite it?-- Yes.

I have no further questions, Your Worship. Thank you, Mr Kerr.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Kerr, you've had obviously many years of experience in Mines Rescue?-- Yes.

And you've attempted to educate others in, amongst other things, the detection and control of spontaneous combustion and that's - you've been involved in that capacity, with deputies and miners and Mines Rescue personnel over the years?-- Deputies and Mines Rescue personnel, yes.

And you brought along the literature that you've been using over the years to attempt to educate people?-- Yes.

And I think in evidence you mentioned that so far as a CO make is concerned the guidelines are to look for figures between 10 and 20 lpm?-- Yes.

They are fairly basic and rough guidelines, aren't they?-- I think it's stated somewhere in the literature - those figures originated, I believe, in Germany, but from memory it's stated in the literature from the SIMTARS seminar in 1988 that those figures do apply for Queensland coal as well.

When I say rough figures, I don't mean to play it down too much, I'm simply saying that they are a guideline to warrant perhaps further investigation in certain circumstances?-- Yes.

So that as a guideline, if you had a make of 10 lpm you would be looking at the situation to assess whether it was a heating or something else that was quite harmless?-- Yes, you would be certainly having a closer look than normal.

Now, the CO make itself is only one sign, isn't it, of a heating?-- Yes.

There are other ones that you've mentioned, and I think you've

detailed them. Without being too repetitive, there is the haze, the smell, anything else that comes to mind as a possible symptom of a heating?-- A physical symptom?

Yes?-- The literature quotes sweating - sweating on the roof and ribs or whatever - no, they are the main ones, I think, smell, sweating and haze.

I suppose it's always a matter of looking at the entire picture to see whether the symptoms add up to a heating or can be explained away in totality?-- Yes.

It had been the practice of the mine apparently to call you in on occasions to do waste inspections and just keep an eye on various areas?-- Yes.

Really as ultimately a safety issue?-- Yes.

Because if a heating was detected it would be a safety issue, wouldn't it?-- Certainly.

Because it would have to be dealt with for the safety of the men?-- Yes.

So you were called in for that purpose on one occasion, 22 July?-- No, I wasn't called in.

Beg your pardon, you were there and you were approached to discuss the issue and then you went down and did some readings?-- Yes.

And what you were told was the concern was a high reading of parts per million?-- Yes.

And it was in the context of what you knew to be a higher than normal CO make for that panel?-- Yes.

When you say higher than normal, you've mentioned a figure of make, we have discussed that; why was this make higher than normal in the No 2 experience?-- In relation to the plots from other extraction panels.

And you had been made aware of those others the previous period, the make from previous panels?-- Not particularly made aware of them, no.

Well, you knew anyway that 512 was higher than those?-- Yeah, by looking at the comparison with the graphs.

And were you also made aware of the fact that it had always been a higher rate than the other panels?-- Well, yeah, that was obvious from the graphs.

So the discussion then turned to what would cause that, the higher rate of CO make in that panel?-- Not as I recall, no.

At some stage that was discussed, was it?-- What discussed?

Yes, whether it might have been a heating or something else?--

No, I don't believe so. I can't recall specifically if that was discussed.

At some stage you seem to have mentioned that to Mackenzie-Wood, the fact that there was a higher CO make?-- Yes.

But there were these other different factors as well to distinguish it from other panels?-- The different method of extraction, yes.

Had you discussed those topics with the management at the mine?-- No.

You hadn't discussed that with Mr Mason at all?-- Not that I recall.

There was no discussion at all with you about possible reasons for this higher CO make in 512?-- Not at that time. It was - attention was focused on the high parts per million reading.

Can I just then ask was there any discussion with Mr Mason or any other member of management about the reasons for the higher CO make in 512 before the explosion?-- I can't recall specifically, no.

You now know, I suppose, that it is claimed that the higher CO make is explained by the different method of production and the loose coal, things like that?-- I wasn't aware that it had been confirmed or -----

In any event, can I come to this: if you had nothing but a higher CO make, that is no signs of any other signs of heating, the only sign being a higher than normal CO make, you may seek to explain such a make on the basis of different methods of production?-- Yes.

But that explanation becomes more difficult if you look at other signs that might indicate a heating; is that so?-- Yes.

And significantly here as you have been referred to other signs in this panel over its life that might indicate a heating; is that so?-- Yes.

And again without going through them one by one, there were reports apparently as early as June of smells inside this panel. That would be significant in terms of coupling that with high CO make?-- Yes.

And then there were later reports the weekend of the sealing of smells and haze, all consistent with there being a heating as opposed to something else?-- Yes.

And indeed, coupled with the high CO make, totally consistent with a heating and more consistent with a heating than simply being able to be explained on the basis of different production methods?-- That would be correct.

If you were seeking to explain a high CO make on the basis of production methods changing, how could you possibly hope to confirm that by investigation or any research?-- It would be difficult.

It would be almost impossible, wouldn't it?-- Yes, unless you had another panel to compare it with.

It would be easy to say that because there was the difference in extraction or production method it may explain the high CO make; it's easy to say that, isn't it?-- Yes, it's easy to say.

As a possible explanation for it?-- Yeah.

But it's very hard to have any concrete evidence that that's what was in fact happening?-- Yeah, that would be correct.

But taken with smells and haze, it would point very clearly to a heating?-- Those symptoms would, combined with that, point to a heating, yeah.

When you were taken - when your advice was sought on 22 July, you simply weren't told that there had been apparently reports of smells being detected in June in that panel?-- I had no knowledge of any smells.

Does it surprise you that, given your advice was being sought about a potential problem inside the panel involving CO, that you weren't told of smells being detected in the panel?-- On that afternoon the focus was on the - was more on the high parts per million reading, yeah.

But the only concern about the high parts per million reading was the effect it would have on CO make and what that might mean?-- Yes.

So, they are all completely interrelated, aren't they?-- Yes.

High parts per million you would be concerned about a heating, and if you are concerned about a heating you would expect to

be told as a relevant factor that there were smells detected about a month earlier in that same panel?-- Knowledge of the background history would be advantageous, yes.

In fact, it would be critical, wouldn't it?-- In deciding if there was a heating or not.

I mean, without knowing there had been smells detected, you could very easily dismiss a reading on the Drager tube of 8 ppm as being a complete aberration?-- It wouldn't be an aberration but -----

You could easily dismiss it as being insignificant?-- You may not relate it to -----

A heating?-- ----- a heating, no.

Coupled with a smell or smells, you would be much more prepared to accept there may be a heating in the panel?-- Yes.

And, of course, when you spoke to Mr Mackenzie-Wood on the Monday following that event, that is 25 July, you sought his advice as an expert in the field?-- Yes.

In fact, he is a well known expert in this very field of spontaneous combustion, isn't he?-- Certainly.

And to speak with him, again it would have been very advantageous, to use your term, to be able to tell him that a smell had been detected in the panel at about - well, a month before?-- It probably would have assisted his assessment, yes.

Of course, you couldn't tell him that because you didn't know yourself?-- No.

And when you spoke to him it was a fairly offhand kind of discussion, you were seeking his views about what it might mean?-- Yes, it was a situation that had the potential to deteriorate, and that was the basis I mentioned it to him.

Now, of course, one way that you would be being very careful about the situation would be to monitor it very closely if you had any concerns at all; is that so?-- Yes.

And you were told that that was to be done?-- Yes.

And you can't remember now whether they said they would be doing it by shift or by day, but certainly the frequency of monitoring or taking the readings was going to be done or increased significantly?-- Yes.

And that was a very prudent method to adopt, to keep an eye on the CO make?-- That would be standard practice, yes.

If you were going to do that, you would have to do the calculations of CO make after you had done the readings?-- Yes.

And then to make any use of that information, you have to do a plot to clearly see the trend?-- Yes.

Just while I am on the question of a trend, there is nothing in the literature, is there, that says the trend you look for to indicate a heating is an exponential rise?-- No.

It's a rise in CO make, continuing rise in CO make, as opposed to anything dramatically sharp?-- Yes. If you get an average steady rise, that's the parameter to indicate concern, yeah.

And you certainly wouldn't have been looking for any sharp rise in a CO graph?-- No.

CO make graph to indicate a possible heating?-- No.

But if you had one, a significantly sharp rise, you would be certain you have got a heating?-- Yes.

In fact, 5 North seemed to indicate that; that was the trend in 5 North?-- Yes.

A rising CO make and then it took off, inclined very rapidly?-- Yes, after several months.

Of course, 5 North was an extremely dangerous situation, wasn't it?-- In what respect?

Well, it was sealed - there was discovered to be a heating on the morning of the day it was sealed and action was taken that day very quickly to seal it?-- Yes.

And there was some significant concern as to whether or not the sealing would be complete and the situation defused; in other words, there was concern about whether the sealing would be achieved and the panel inertised?-- Yeah.

Before something happened, I mean, before it exploded?-- Yes. I think there was a great deal of concern during that day. Everything was done at the most rapid possible -----

In a panic situation virtually because the CO make had taken off?-- I don't think you could relate it to a panic situation.

I am not meaning to denigrate those involved, it was just a very urgent sealing?-- Yes, it was recognised that those seals had to be completed as soon as possible.

To achieve a safe situation?-- The start of the inertisation process.

Really if you wait to see a CO make take off in that fashion, you are really fighting against time, aren't you?-- You make it difficult for yourself, yes.

And that's why what you should be doing is looking for a

gradual continuing increase in the CO make and seal it if that continues?-- Yes.

Before it starts to rise very sharply?-- Yes.

On the same day that you spoke to Mackenzie-Wood you also spoke to the Chief Inspector, Brian Lyne?-- Yes.

At that stage you were the Acting State Manager of the Queensland Mines Rescue Brigade?-- That's correct.

And in that role you had very regular contact with the Chief Inspector?-- Yes.

Over a whole host of things ranging from finances, budgetary considerations?-- Mr Lyne is the DME representative on the Management Committee of the Mines Rescue Brigade.

So, you had very close contact with him when you were Acting State Manager?-- Regular contact.

And most often on the phone?-- Yes.

How often would you ring him over that period?-- It would be contact on like a regular - irregular basis, if you know what I mean. It might vary from three times a day to three times a week to three times a fortnight, something like that.

And, as you acknowledged, the matters range from financial, budgetary considerations to committee matters?-- Yes.

Election of members to committees and your membership of committees?-- Yes.

Industrial matters such as the negotiations for new awards, things like that?-- Yes.

Claims for extra payments?-- Yes.

At that time there were proposals for legislation relating to the Mines Rescue Brigade and you had discussions with him about that?-- I can't recall that specifically, no.

Discussion with him over this period about having more - that is, the superintendents of the individual brigades having more contact with the mines they were involved with?-- I can't recall that specifically, no.

Anyway, you certainly acknowledge having very close contact with him over this period when you were Acting State Manager?-- That's correct.

And one of these calls that you have referred to here on 25 July in fact was made in connection with proposed discussion with him about a Drager instrument, was it?-- No, no, I rang Mr Mackenzie-Wood about an evaluation they were doing on a new type of breathing apparatus.

And you rang Mr Lyne about Mines Rescue Brigade matters?--

Yes.

And in discussion about other matters you mentioned having spoken to Mackenzie-Wood about the CO make in 512?-- Yes.

But assured him you had been told by the management at the mine that they were closely monitoring the situation?-- Yes.

In other words, indicating to him, that is Mr Lyne, that the management were aware of the situation and were taking steps to keep an eye on it?-- Yes.

Which would be the entirely appropriate action to take?-- Under those circumstances, yes.

Now, just a couple of matters about the training of members of the brigade. Part of that training involves training the men in Ellicott diagrams on a computer, Coward's Triangle, all those sorts of things involving computer equipment?-- No, we don't have a computer as a training aid at the rescue station, no.

No, the point I was coming to: to do that sort of training you have to rely on the individual mines giving you access to their equipment, don't you?-- No, you can train a person very well on an Ellicott diagram without the use of a computer.

Put it this way: the point I am making is it would be beneficial to the brigade to have the computer facilities for training purposes?-- I suppose any new facility is beneficial, isn't it?

That's right. It would be an easier process to train in many respects with computer facilities as opposed to having rely upon the literature and general knowledge?-- Yeah, it would improve the situation.

Part of the training that Mines Rescue Brigade members receive obviously, I suppose, is to be aware in a rescue situation of what gases they are going to encounter before going underground?-- Yes.

And part of the process of finding out what that might be or what they might be is to sink boreholes into a section to analyse the gases?-- Yes.

And that's a fairly common practise after an incident such as the one on 7 August?-- Mmm.

In this case it was done, sink boreholes after the incident?-- Yes.

To obtain samples and analyse them so that you would know what the atmosphere was like inside the mine or whether you could send a crew in to achieve recovery?-- Yes.

There was some problems, weren't there, in getting samples from the boreholes?-- Yes, we encountered some problems.

The procedure for sinking boreholes and taking samples from them doesn't at this stage form part of the Mines Rescue Brigade training, does it?-- Not specifically, no.

Would it be advantageous to have that included in a module in the training to cover situations such as that that occurred on the 7th?-- Yes, as a result of that experience it would be.

I suppose it's a matter of time and resources, but ideally that would be a useful adjunct to the course?-- Yes.

In relation to the multiwarn, you have indicated the way it can be used and the disadvantages that a multiwarn has; is that so?-- Yes.

A Drager has the obvious disadvantages we have already discussed; is that right, the subjective element of reading the tube, etc?-- Mmm.

In a situation such as this you have deputies and others using Drager tubes, but you also have a back-up system or a system of monitoring on the Unor system, don't you?-- Yes.

So, one way you can very quickly check whether a Drager reading is out of sync with the others is to check the Unor print-outs?-- Yes.

And, by and large, they would give you a fairly accurate picture of what the CO parts per million were over a given period?-- Yes.

And indeed this reading of 8 ppm could have been checked against the Unor records for that same period, if you like, to see whether it was out of sync with those. That would be a quick way of ascertaining whether or not the Drager was in fact inaccurate or inaccurately read?-- Well, you can't say it was inaccurately read. You might say whether the CO was there or it wasn't there.

If you were wanting to very closely monitor in an ongoing fashion the CO make, perhaps the most accurate way to do that - the parts per million of CO - would be refer to the Unor system?-- Depending on what stage you are at.

What do you mean by that?-- What stage of the monitoring process you are at. Have you suspected a heating or what?

If we take it back to, say, 22 July when you became involved - and you have told us you had known about the smells a month before and the high CO make reading - you would then start to closely monitor from that point on?-- Yes.

To get the most accurate representation of the parts per million CO, you would go to the Unor, wouldn't you?-- No, you would use the Camgas system - the gas chromatograph.

I'm sorry, all right. And that would tell you whether there are higher hydrocarbons present in the atmosphere that might tip you off to a heating?-- Yes.

Putting that to one side for a moment, doing the CO make calculation and monitoring that closely from 22 July through to 7 August, the most accurate form of your parts CO reading would be from the Unor, wouldn't it?-- Yeah, that's the benchmark.

If you want it to be accurate, you would use that ahead of, perhaps, Drager readings, or perhaps compare both?-- Compare, both.

If there is any significant variation between the two, you would probably prefer the Unor's?-- Yes.

You would also monitor the quantity of air?-- Yes.

And that has to be done obviously by the manual measurement?-- Yes.

And you could see whether that varied much over that whole period as well?-- Yes.

Then you would have a reasonably accurate representation of a CO make over that period wouldn't you?-- Yes.

And if you plotted it, you would be able to see the trend in front of you?-- Yes.

Do you know of any occasions at No 2 - or anywhere, I suppose - at Moura where the gas chromatograph was used to your knowledge to sample the atmosphere?-- Not in an active situation, I don't think, yeah.

You were aware, I take it, that SIMTARS were available for consultation about these sorts of issues?-- Yes.

That was well known as far as the mining community of Moura went - amongst those in a position to be seeking advice from SIMTARS?-- I am not aware if the particular people were aware of that service that SIMTARS provides.

In any event, you were aware of it?-- Yes.

Thank you, Your Worship.

MR MARTIN: Your Worship, I will be far quicker - with a lot of my questions taken by my friends - if I could regroup overnight?

WARDEN: Thank you, gentlemen. Thank you, Mr Martin. We will refer your questions then to tomorrow morning. 9.15.

THE COURT ADJOURNED AT 5.27 P.M. TILL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 09/02/95

..DAY 22

THE COURT RESUMED AT 9.19 A.M.

DAVID CHARLES KERR, CONTINUING:

CROSS-EXAMINATION:

MR MARTIN: Mr Kerr, yesterday you were talking about a Drager/Multiwarn CO testing device, weren't you?-- Yes.

Could you just help the inquiry with the cost of an instrument of that kind?-- The cost of the Multiwarn is approximately $6,000.

Is there a known error factor with the Drager tube system?-- Yeah, the manufacturer's literature says standard deviation of 15 per cent.

And is that in addition to, can you say, to one's subjective look, if you like, at the tube?-- I think the subjective factor would have to be contained within that figure.

Yesterday you produced for the Inquiry a variety of material that you had at Mines Rescue, and I don't want to take you through any of it to any real extent, but there is a difference, isn't there, between the red book and the blue book?-- Yes.

The blue book, as I recall it, is more extensive than the red -----?-- Yes.

----- in terms of information which is given out?-- Yes.

And am I correct when I say I understand that the blue book is more for officials in a mine?-- That was the original intention.

And the blue book in fact deals towards the end of it, if I recall it, with what should be done after a sealing in terms of evacuation of the men. That's so, isn't it?-- Yes.

You nod your head a little in response, and these ladies have to take it down?-- Yes.

What do you consider good practice when a panel is sealed whilst it goes through the explosive range and inert stage?-- If the panel is sealed under normal circumstances I don't see any problem in allowing it to go through the explosive range whilst the mine is still producing.

While the mine -----?-- Is still producing, people still working in the mine.

But in your view, even in that circumstance should a close eye

be kept on scientific instruments?-- Yes.

To see what is happening?-- It would be a standard - a good practice.

You produced one document yesterday, and I may have misheard you, I think it was Prevention and Control of Spontaneous Combustion and my note reads, perhaps incorrectly, that that was received at Moura Mine in 1980?-- Yeah, one of them was stamped "received" at Moura Mine, yeah.

Did you get it from the mine?-- Yeah, it was a photocopy.

Did you at Rescue, not you particularly, but Mines Rescue, receive magazines periodically from SIMTARS?-- Yes, we received the SIMTARS magazine.

Of the various documentation that you produced yesterday, whether in relation to training of deputies or brigade members, what of that do you know was present at Moura No 2 Mine of your own knowledge. What have you seen there?-- The red and the blue books and the books by Jim Strang and Paul MacKenzie-Wood. I can remember those.

Can you recall any SIMTARS magazines at the mine?-- Not that I can recall.

I will just show you three documents and ask whether you've seen them before. Have you?-- Yes.

Did you receive those at Mines Rescue?-- Yes.

Have you seen those at the mine?-- Yes, I think I did see those at the mine, yeah.

Of the documents that you have received that you've seen at the mine, where did you see them?-- That I couldn't be specific on.

Just for the record, Your Worship, the documents that Mr Kerr referred to were volumes 1, 2 and 3 produced by SIMTARS, I think broadly described as perhaps training of mine officials. I can't - what's on the outside of volume 1?-- Yeah, Training of Officials for the Underground Coal Mining Industry.

The first volume is already an exhibit, Exhibit 29. I don't propose to tender any more of those, Your Worship. At the Mines Rescue did you teach graphing, teaching the men, whether they would be deputies or brigade members, graphing of CO litres per minute?-- Yes, plotting a trend, yeah.

I will just show you a document and ask whether you think that document, after you have studied it, would be of assistance to the rank and file whether they be deputy or ordinary miner. On the vertical it has parts per million, doesn't it?-- Yes.

Starting at five, I suppose, up to 60, and the bottom axis is a notation of velocity in cubic metres per second?-- Yes.

And then you have a curve, three curves in fact, one green, one brown, one red, with a 10 litre 20, 30 litre per minute curve respectively on it?-- Yes.

Now, is that the kind of document that you think a man who perhaps didn't have a lot of education, perhaps a lot of understanding even, could readily look at and see for himself exactly what he should do when he got between, say, nought and 10 litres per minute?-- Yeah, it looks as though it provides an easily recognisable -----

Do you think that would be of help at Mines Rescue?-- Yes.

Do you think it would be of help at a mine, coal mine?-- Yes.

So one could go to the board - a board somewhere where that was posted up, and look for himself and say, "Heavens, I've got 15 litres per minute, the velocity is X and that puts me" - or puts that into the extreme danger area?-- Yes.

I tender that.

WARDEN: Admitted and marked Exhibit 149.

ADMITTED AND MARKED "EXHIBIT 149"

MR MARTIN: Mr Kerr, you told Mr Clair yesterday, I think it was, that Mr Abrahamse had informed you that the reading obtained on 22 July, prior to the time you went down, had been in consequence with the reading of litres per minute make and it was high because there was an error in the velocity reading of CO. I think you said, had you known that, what you did may well have been different in terms of your concern?-- Yes.

And I suppose any sense of alarm which you might have had

would have been allayed, as it were, by Mr Mason's statement to you that there was going to be an increase in the frequency of monitoring?-- Yes.

When you spoke to Mr Mackenzie-Wood, I think it was on Monday, 25 July, did he tell you that in response to the data you had given him, he really couldn't pass any opinion?-- We concurred that the probable cause of the higher rate was the different method of extraction.

Something you said yesterday confused me probably because I misheard you. On the Friday afternoon, that is 22 July, you had a figure in mind of 8 lpm as some sort of base or standard or norm?-- Yes.

And you referred to some graphs. Were they the graphs of the other panels?-- Yeah, we looked at several graphs that day.

But any graphs relating to 512?-- I cannot specifically recall if there was a 512 graph there or not.

When you went underground with Mr Abrahamse and Mr Atkinson, was it, on Friday the 22nd?-- Yes.

Was there a velocity reading taken?-- Yes.

And who took that, do you recall?-- Mr Abrahamse.

And, of course, at the cross-section at the monitoring point?-- Yes.

When you visit the mine, or any mine, for that matter, is it the case that you have no right whatever to insist on the production of any documentation?-- I have no statutory authority at any mine.

So, all you can do is rely upon what you are given or told?-- Yes.

It may be asking a little too much at this stage, but when you got to the mine on 7 August 1994 after the explosion, did you hear any explosions - any sirens?-- No.

I think you said that there were - the Unor screen was in red alarm mode?-- Yeah, there was some -----

But you weren't able to be succinct about that?-- No.

With the state of the art technology of gas chromatograph and indeed Unor, it's the situation, isn't it, where a heat or the temperature of a heating, if one exists, can be readily determined on analysis?-- I wouldn't say readily determined. The CO/O2 ratio gives an indication of the temperature of a heating.

And that's available, of course, even before a sealing, isn't it?-- Yes.

CO/O2?-- It's available all the time.

That's Graham's Ratio, isn't it?-- Graham's Ratio, yes.

There is another ratio, CO/CO2 ratio, which is readily determined if not by a graph, just by applying a formula one to the other?-- Yes.

And if I recall correctly, that's a parts per million of carbon monoxide divided by the percentage of carbon dioxide?-- I'll have to take your word for that one.

All right. Is it the case that physical signs such as smell, sweating and haze depends on one's senses and it then depends on the veracity, as it were, of one's senses as to whether they are in any way helpful; that is, a man with a nasal condition would have trouble - could have trouble detecting the strength of a smell?-- He may do, yes.

Indeed, one's eyesight as to sweating?-- Yes.

And, therefore, the scientific instrumentation available assumes the greatest importance, I suggest, at the end of the day?-- At the end of the day you would have to say that, yes.

It's the case, isn't it, that there are literally a host of variables involved in spontaneous combustion so that it's fairly useless comparing one panel or one mine with another?-- Yes.

And I suggest that the greatest, or the most important factor in spontaneous combustion is the fact that it can happen or that it has happened before?-- Yes.

When you went down as far as you did in return No 1, I think it was, on 22 July, you got down to about 4 or 5 pillar, I think, inbye the adit. Can you see any reason why there wasn't - why there couldn't have been a final monitor point behind the seal located well inbye?-- Not in that roadway. It appeared to be stable.

And that's the higher side of the panel, isn't it?-- Yes.

Where methane would be most likely to collect?-- After sealing?

Yes?-- Yes.

Just a few more things, if you would be patient with me, Mr Kerr. When you, with the aid of others, took the readings on 22 July, did you venture or did you open any of the doors or the stoppings?-- No.

You know that on 22 July 1993 the reading which was said to be wrong produced a make of about 18.62 lpm?-- Yes.

I would just like you to assume the following, then tell me what you say about it. Couple that with a reading of

19.35 lpm on 28 July taken by a Deputy Newton, a reading on 1 August '94 by Deputy Moody of 18.93 lpm with a reading by a Deputy Mr Klease on 6 August varying between 18.93 and 21.04. If you were consulted and you were told those things, what would your reaction have been?-- Well, using the parameter of 20 lpm, it would be of great concern.

It would be indicative, I suggest, of a heating?-- Yes.

And what is the best thing that management can do in relation to looking at risk, and particularly risk of spontaneous combustion? It's the worst case scenario rather than the best, isn't it?-- Yes.

Because of the capacity for monumental harm both to life and indeed to resource?-- Yes.

Do you have any comment to make about a final monitor point being in roadway 3 at cross-cut 1? I know it forms no part of your function. Do you give any training about that?-- No.

You have a high degree of experience and expertise. What do you say about that?-- That it would be more advantageous to place it where it would provide a representative reading from behind the panel.

I suggest that's at least in the top return and perhaps well inbye?-- Yeah, if conditions permitted the establishment of those points, it would probably provide a more representative reading.

The Unor system, do you know much about that?-- In what respect?

In terms of its capacity to, say, accept or analyse more particularly for hydrogen?-- No.

You partly answered this from one of my learned friend's questions yesterday, so I will take it a little further. Did any of Messrs Schaus, Mason, Squires, other undermanagers, Mr Abrahamse or Mr Barraclough ever do any upgrading or training with you?-- No, only - the only training of those people would be the undermanagers who are members of the Mines Rescue.

Are there any?-- Yes.

Who are they - who were they at that time?-- Mr Squires, Mr McCamley, and there was a Mr Sim there too.

And when would they have done any specific training or retraining, can you help with timing?-- Retraining on what?

On anything, but particularly on spontaneous combustion?-- Mines Rescue training is conducted at two monthly intervals, six per year.

That doesn't quite answer the question, does it? Spontaneous combustion training in particular I am interested in?-- We

would probably touch on specifically spon com once or twice a year.

And before 7 August 1994 can you help the Inquiry at all with - as to whether any of those gentlemen you have mentioned were there when the spon com was touched on?-- No, I couldn't recall that off the top of my head.

You would agree, wouldn't you, that a CO graph produced on a weekly axis or basis would even out any high spot that might have been found during the week, assuming the other readings were low?-- Yes.

And that, I suggest, is a bad practice, particularly in the critical stages when a panel is coming to the end of its production life?-- Reducing the time frame would provide a more accurate interpretation.

Just tell us a little, if you would - there was a probeye at Mines Rescue?-- No.

There wasn't?-- No.

Do you know whether or not one was at the Moura No 2?-- Yeah, there is one at Moura No 2, yes.

And was before the explosion?-- Yes.

I would just like very briefly to talk about pressure differential. Is it the case that pressure differential and air flow are very important in determining the quality and quantity of ventilation?-- Yes.

And is the way, and perhaps the only way to determine it by means of a Magnahelic device?-- By means of a what?

It's called a Magnahelic. It specifically measures pressure differentials?-- I'll have to take your word for that one.

You don't know much about that?-- No.

And I suggest there is a distinct relationship between spontaneous combustion and pressure differentials?-- In certain situations underground there is, yes.

Can you just satisfy my curiosity? You have told my learned friends about haze and sweat. At roughly what temperature do they come off at?-- Approximately - well, as soon as the inherent moisture begins to be distilled from the cold being heated.

Would you agree with the temperature at something around 100 degrees Celsius, or do you think something before that?-- A bit before that, yeah.

To put it simply, a tarry smell or a benzene smell emerges being liberated from coal in the form of acetones and formaldehyde and tars and a host of other volatile gasses at temperatures greater than 40 degrees Celsius; do you agree with that?-- Yes.

We have heard quite a bit in this Inquiry about diesels and perhaps hazes from a diesel - perhaps it is from something else or a heating up - there is a ready measure for measuring oxides of nitrogen?-- Oxides of nitrogen?

Yes?-- Yes.

What are they? One is the Drager system, isn't it?-- Yes.

And another, of course, is the gas chromatograph?-- Yes.

And oxides of nitrogen do not emerge from coal, but may emerge from diesels?-- Yes.

So the use of the available technology would readily determine whether oxides of nitrogen came from diesel or from coal?-- Yes.

One last thing, and tell us quickly - I would just like to ask whether or not you have ever seen papers by a Dr Chamberlain in England?-- On what type of subject?

Well, it is called the "Ambient Temperature Oxidisation of Coal in Relation to the Early Detection of Spontaneous Heating"?-- I can't recall.

I'm not suggesting you should?-- No.

Thank you, Your Honours.

CROSS-EXAMINATION:

MR MORRISON: Mr Kerr, in the training that's given by Mines Rescue, do I understand correctly that that is largely confined to the membership of Mines Rescue?-- Yes.

But not closed to anyone else who wants to participate?-- You would have to be becoming a member to participate.

I see. So, if someone just fronted at Mines Rescue and said, "Look, I'm not actually a member and don't yet wish to be one, but you have got a very good course and I would like to join in.", you would tell them, "Sorry"?-- No, if the circumstances were favourable, there would be no reason why not.

And, in fact, there is quite a membership of Mines Rescue, isn't there, across mines generally?-- Yes.

And quite a membership from Moura?-- Yes, we had - in relation to the total underground workforce, our percentage was fairly high.

And those members of the workforce at Moura who were members of Mines Rescue crossed across the boundaries; there was not only just general miners, but undermanagers, deputies, and so forth?-- The whole cross-section.

Would I be right in saying that, by and large, because of your position, you would have taught most of those Mines Rescue members at Moura?-- Yes.

You having been there for such a long time?-- Yes.

So that the training at Moura No 2, in so far as - we are dealing with Mines Rescue now - would be of a fairly uniform standard to all of those who passed under your gaze?-- Yes.

And we can tell from your syllabus and various documents the general nature of what they were told?-- Yes.

And am I right in saying that you would have had something of the order of, what, 40-odd people from Moura that you trained?-- Yeah, towards - yeah, prior to the explosion I think there were 38 members, something like that.

And three of those persons who were unfortunately caught in this incident in August were members who were Mines Rescue trained by you?-- Yes.

Mark Nelson, Mr King and Bob Newton?-- That's correct.

Could I just ask you to look at this list, please, because I think you will confirm for me that this is a list of those persons trained by you - that is, of the Moura No 2 workforce - those persons who were trained by you and when?-- Yeah,

that's correct.

Are they all deputies, or is this simply Mines Rescue? I think they are all deputies-----?-- No, that's the whole lot - the whole cross-section.

We can add up the numbers, but it looks like 38-odd people?-- All right.

I tender that list.

WARDEN: Admitted and marked Exhibit 150.

ADMITTED AND MARKED "EXHIBIT 150"

MR MORRISON: I notice in that list - you probably don't need it in front of you for this purpose - people like Len Graham, Steve Bryon, John Blyton-----?-- Yes.

Those three that I've mentioned are very experienced miners and deputies - not Bryon, but the other two are deputies and Steve Bryon is a very experienced miner?-- Steve Bryon is a deputy as well.

Sorry, of course he is. And it was Mr Bryon who took the 8 parts reading that you went to check on 22 July, wasn't it?-- Yes.

But you knew about that actually before you were asked by George Mason to go down the pit?-- Yes, I found out in the afternoon.

And John Blyton told you about it?-- That's right.

John Blyton is a fairly senior member of Mines Rescue?-- Yes.

In fact, I think he has even taken over your position when you have been off elsewhere?-- That's correct.

He has been in charge of the Mines Rescue Station?-- Yes.

He then obviously knew about the 8 parts and raised it with you?-- Yes.

In what context did he raise it with you?-- As just a matter to be noted, or something out of the ordinary, yeah. He called in at the Rescue Station on the Friday for some other reason and just through the conversation - yeah.

He obviously thought it was important enough to tell you about it?-- Yes.

And so you knew of this reading before you got to the mine?-- Yes.

You were going there on routine matters, I take it?-- Yes.

To do with maintenance in the substation?-- That's correct.

And therefore it was no surprise, really, when George Mason spoke to you about that reading?-- No, I knew about it.

And you had also gathered its significance yourself?-- Well, any sharp rise in a CO reading is significant.

Well, let's accept that. You knew that that reading hadn't been matched on the Unor screen?-- Yes.

By Unor readings, it was quite inconsistent with all of the Unor readings?-- Yes.

And markedly so?-- Yes, 3 ppm is - yeah.

You probably knew from what John Blyton had told you, or from Steve Bryon, anyway, that that reading had been taken virtually at the monitor point?-- No, I couldn't-----

You didn't know that?-- I didn't know specifically where it was taken.

Let's assume that that's the case. Let's assume Steve Bryon took it very close to the actual monitor point for the Unor; in normal circumstances, if that was the case, you would expect him, if he has done everything right, to get the same CO level as shows on the monitor?-- Yes.

But if he is within a few metres of the head, there is not going to be any discernible difference?-- Providing the Unor is not leaking.

Providing the Unor is not leaking. There is no suggestion of that?-- All right.

Provided he does everything right?-- Yes.

The correct number of pumps, and so forth. Let's assume, too, that he did everything right and read the tube correctly so the right number of pumps and his perception of the level was correct, there is still some possibilities to explain why there is the difference, isn't there?-- Yes.

For instance, it is not unknown to have a faulty tube?-- I have never encountered a faulty Drager tube.

It is not impossible, though, is it?-- It is not impossible.

It may be he was distracted when he was reading it?-- That applies to any instrument.

Assuming he does the right things and he is near the monitor point, he should get the same reading?-- Yes.

But this one was markedly different?-- Yes.

You knew that by the time - basically by the time that George Mason spoke to you?-- Yes.

And it suggested in your mind that there was something abnormal or out of the ordinary with that reading - quite apart from its height - it wasn't matched by the monitoring system?-- Yes.

So there was a question mark that had to be put over it?-- Yes.

Which is exactly why George Mason asked you and you were quite happy to agree to go down and check it out?-- Yes.

To test again and see if, in reality, the Unor was right, or Steve Bryon was right?-- Yes.

The long and the short of it is that all of the testing you did, and the testing of Mr Abrahamse, confirmed that the Unor was right?-- Yes.

And that, in terms of make, assuming the same velocity, would have a dramatic difference in the make, wouldn't it?-- Yes.

Let's go back a step, if I may? You were at the mine talking to Mr Mason and you got shown some graphs?-- Yes.

By Mr Mason or by Mr Abrahamse?-- I think Mr Abrahamse brought the graphs in from his office. We were sitting in George's office.

This was before you had gone back to get the low range tubes?-- Yes.

And you had mentioned in your statement - and I think you said yesterday that, in fact, you were able to do a comparison of various panels------?-- Yes.

-----from those graphs, and in that way form a view that this make for 512 was above the others?-- Yes.

It is therefore almost certain that one of the graphs you saw was a 512 graph, otherwise you couldn't make that comparison?-- Yes.

I know you can't now specifically remember which graph it was, but let me just show you some if I may, and see if any of these graphs you recognise. Could the witness see Exhibit 110? They are CO make graphs for just 512?-- Yes.

And you will see, if the exhibit's like mine, it runs in reverse chronological order - the top one is the most recent up to 6 August - if you look at the bottom right-hand corner for the dates; is that so?-- Yes.

Well, clearly you couldn't have seen that one. You couldn't have seen - you might have seen the one just before that?-- 22nd.

Yes. Does that ring a bell?-- It may have been the one that I looked at.

All right. Well let's assume that that one wasn't in existence at that point of time. Look at the previous one. That's for the week before?-- Yes.

Does that ring a bell?-- I may have looked at it or I may not have looked at it. I can't specifically recall if it was this.

I understand you can't specifically recall, I'm just trying to see if we can jog your memory a little. Maybe we can't, who knows. Is that sort of graph - let's deal with it generally - is that sort of graph one of the sort of graphs you saw that day?-- Yes.

That sort of thing?-- Yes.

And for a 512 graph that's the sort of graph rather than an entire life of the panel graph?-- Yes, they were similar size, shape for all the other extraction panels.

It obviously couldn't be the entire life of the panel, it was still going?-- No.

If we assume that on that Friday when you were there that this graph to 15 July was the then current graph posted up a week before, there is a reasonable degree of likelihood that that's the graph you were shown?-- Yes.

Now, you would have seen from that graph pretty well straight away, as you could now - that's the 15 July graph?-- Yes.

That for a portion of that time the reading has been over 10?-- Yes.

It's obvious - just one glance at the graph tells you that, and it's dipped at one stage, but for a portion of the time it's been over 10?-- Yes.

Now, you were obviously aware of that on the day, that the 512 make was over 10?-- No, I had in my mind that the average was about eight.

I understand when you rang MacKenzie-Wood you were saying you had that in mind. Let's just examine the graphs for a moment. Just keep that one with you, if you could leave it open at 15 July and put it to one side next to you for a moment. Could the witness see Exhibit 21, please? What I want you to have a look at is a couple of other graphs that I think may be the ones for other panels that you were shown. This exhibit is a compilation of things. I want you to turn four pages in - five pages in actually because there are a number of tables and things which relate to later periods?-- Yes.

Five pages in you will find a CO make graph in much the form you've just seen?-- Yes.

For 401, 402?-- Yes.

Do you see that? Now, having now looked at that do you think that that might have been the graph for 401 and 402 you saw?-- It may have been, yes.

And likewise that one you would have seen for, say, the first half of that graph, it was under eight and for the second half of the graph there were significant periods of time where it was over eight?-- Yeah.

In fact if one looks at the dates - let me just try and pick one - say November 1993, you will see that just above the word "date"?-- Yes.

If you run up there, from that point on, with the exception of a period around December 1993, the panel was running above eight for quite a period of time?-- Yes.

Quite - in fact if we look at the dates it was running above eight for about three months, November 1993 through to about February 1994?-- Yes.

Can I just ask you to turn over two more pages and there is the CO make graph that was in existence at that time for panel 403?-- Yep.

Looking at that graph do you think that might have been one you were shown for 403?-- It may have been.

That's a much lower figure for the life of that panel?-- Yes.

But by the comparison you can easily see now both 401, 402 and 512 were running significantly above 403?-- Yes.

401, 402 for a considerable period of time. Now, if you have a look at two more pages over you might see - three pages over it might be, CO make graph - beg your pardon, for 5 North. Now, looking at that graph do you think you might have seen that graph that day too?-- I may have.

You did have a 5 North graph there, I'm pretty sure of that?-- The panel that was heating?

Yes?-- Sealed because of the heating?

Yes?-- Yes.

If you just want to jump up and flick the big map down on the board behind you, hopefully that will show the whole mine. Can you see 5 North up on the right there, the north west side - no, left -----?-- The what?

Bring me a laser pointer. Give me my turn of the red light. I should say may I borrow the laser light? Here will be a test of last night's behaviour. That's 5 North -----

MR NEILSON: You've covered the whole map so far.

MR MORRISON: See that panel there, that's 5 North. There is 5 North West. I'm not going to do that exercise again. I will give you a bigger plan - not a bigger plan, a plan that shows the panels and then we will agree on this and move on. Have a look at this one. My very erratic indications, I think, would have led you to 5 North being the panel I indicated?-- All right.

You can put that map aside now that we have done that. I will have that one back too. You did have a 5 North graph there and it may have been this one?-- It may have been, yes.

I think I'm right in saying that when you went to get the tubes you in fact brought a graph back with you?-- The 5 North West panel that had been sealed.

Yes, you brought back the 5 North West graph yourself?-- I'm not sure if it was there or I brought it or what.

I can ask you to look at a document? We will have a look at it in a moment. You are not sure whether you brought it back or it was there anyway?-- No.

Well, looking at this graph then - we are staying with 5 North now. When you look at that graph that would show you fairly clearly that that panel ran at figures above 10 for a considerable period of time, something approaching four or five months and fairly, for a significant part of that time, flat during that run?-- Yes.

And then on the right-hand side we can see it take off. That was 1986 when that occurred, that was the sealing you were involved in, I think?-- Yes.

Now, if you can turn over a couple of more pages, two more pages, you will see the CO make graph for 511 which is the next door panel to 512?-- Yes.

Now, looking at that now do you think you might have seen that graph that day, the comparative for 511?-- I may have.

You would see also that one running for a portion of time - not that long, a couple of months - at figures above eight?-- Yes.

Turn over three pages, please - no, five pages. You should come to a somewhat different looking graph?-- Yes.

One that is headed "5 North East return VS14"?-- Yes.

Now, that is in fact a graph in respect of 5 North West, wasn't it?-- Yes - that was the panel that was sealed.

Sorry?-- That was the panel that was sealed.

Yes. Looking at that now do you recognise that as a graph that you brought back or you were shown at the mine?-- Yes.

Which? Do you remember now that you brought it back?-- I'm not sure whether I brought it back or it was at the mine when we were looking at all the other graphs.

Certainly this is one you certainly can remember seeing?-- That's the one, yes. I've seen that many times.

Now, we would see from that as we look at it that at times that panel ran above 10; is that so?-- Yes.

From time to time, and then right at the end of its life it took off in a great way?-- Hang on a minute. The dotted line

is the litres per minute make.

Well, even if you look at that?-- Yeah, well, it doesn't.

It's under 10 then takes off?-- Yes.

Now is that what you might have been thinking about when you were saying average about eight?-- Yes, in comparison with this we were running higher than this 5 North West one.

But when you were talking about an average figure of eight, this is likely to be where you got that figure from because this is the only one that would suggest an average of eight. None of the others suggest an average of eight?-- It may have been.

You couldn't look at the 512 graph and think it had an average of eight?-- No.

So we should discount that I think, shouldn't we?-- Yes.

In so far as you plucked a figure out - I'm not suggesting you just plucked it out, in so far as you had eight in mind, I don't mean to be flippant by that - it's likely that you had this in mind?-- No, I was thinking about an average, an average, yeah.

In respect of this graph that we are looking at here, you made a comment about this to either Mason and Abrahamse or Abrahamse and people that were there; can you recall that?-- In relation to this?

Yes, this particular graph?-- What about it?

Can you recall making any comment about it?-- Yeah, I said that we are running higher than this, the 5 North West one.

And something else about this?-- No, I can't remember anything about what I said.

What I suggest you might have said was this, showing them the graph and pointing to the right hand saying, "This is the way it can take off."?-- I may have said that, yes.

You can put that to one side for the moment. Having seen the documents that I've just shown you, there could be no doubt on the day you were aware of the fact that the CO make graph was running above 10 and it was obvious from the graph?-- I had it in my mind it was around about eight.

You were talking an average, I'm talking about how it was actually running?-- All right.

The graph undoubtedly showed you that, it was running above 10?-- The 512 one?

Yes, I'm only talking about 512 now, I'm sorry?-- All right, yes.

Can I just ask you one other thing about this: when you were speaking to Mr Mason - I'm not going to take you back to the documents for the moment - when you were speaking to Mr Mason it was he who involved you in this and suggested you might like to, if you were willing, go and check it out; you were quite happy to do that?-- Yes.

In fact Mr Abrahamse was happy to have you involved too?-- Yes.

On the way down expressing the view that your presence would sort of lend credibility to anything he did?-- I don't recall that.

Maybe such praise falls off your shoulders fairly easily. Atkinson went with you, he is an experienced undermanager?-- Yes.

When you were down there Atkinson didn't actually take any readings, it was you and Mr Abrahamse?-- That's right.

Each of you took readings on the Dragers, one using a high range, one using a low range?-- That's correct.

And each of you got the same result -----?-- Yes.

----- in each place?-- Yes.

While you were there looking at the panel, and it may have been while you were walking down the top return, I'm not sure, Mr Abrahamse asked you something about expectations in the panel or expectations then; do you recall -----?-- Expectations of what?

He asked you should something be happening, should he be experiencing something?-- I don't recall that either.

He asked you should he be smelling something?-- No, I don't recall him saying that.

You can't recall it, but it's possible that he asked you that?-- All right.

You agree it's possible?-- Yes, it's possible.

He said to you, "Look, Dave, should I be smelling anything?", and your response was, "I can't smell anything."?-- That may have been the case, yes. I certainly couldn't smell anything.

Had he said that to you it was - let's assume he said that, it's a clear reference to one of the indicators of spontaneous combustion, isn't it?-- Yes.

Should there be a smell experienced with the readings you were getting or the situation?-- There may have been a smell, yes.

And had that been mentioned to you you would not have missed its significance in terms of what it meant to spon com?-- No.

In any event you detected nothing down there which would suggest that there was any spontaneous combustion event occurring in any way?-- Nothing.

In fact you say in your statement at page 5 - if you need to you can look at it - following the inspection you actually formed the opinion that there was nothing indicating spontaneous combustion?-- That's correct.

And that led you to the conclusion which you made that this higher CO make was probably the product of the method of mining?-- Yes.

Do I assume correctly that someone - you either knew or someone told you about the sort of mining method; do you know there -----?-- Yeah, in general conversation I heard it was different, first time trying this new method of extraction.

You must have known some of the details, perhaps not in precise terms, but ramping and bottoms?-- Yes.

Take a row, leave a row, things like that?-- Yes.

Your conclusion at the end of the day was, well, effectively three-fold. Firstly the eight parts reading had not been verified and was probably erroneous?-- Yeah, we didn't verify the reading and it was not persisting.

And secondly that there was no evidence of a spontaneous combustion incident?-- No physical indications.

And thirdly that an explanation for what was occurring in relation to the make was the different method of mining?-- Yes.

When you relayed details of your inspection in so far as you did to Paul Mackenzie-Wood he concurred with your opinion?-- Yes.

Obviously he hadn't had the benefit of walking the panel -----?-- No.

----- like you had, but no doubt he was relying upon your description of the inspection and the method of mining and so forth?-- That's correct.

When you talked to Brian Lyne the next Monday, I think it was - maybe it was a couple of days after that, I'm not sure?-- The following Monday it was, yeah.

You in fact conveyed to him what we have been discussing, the fact that you had been there, what you had seen and experienced and the details of your conversation with MacKenzie-Wood, and I don't mean to suggest that you said, "And then I said to Paul and then he said to me" -----?-- The context would be what you are saying, yes.

You would have conveyed to Brian Lyne that the CO make was running higher than other panels?-- Yes.

And that there had been an abnormal reading?-- Yes.

I'm only pausing because you have to respond verbally?-- Sorry. No, I don't know if I would have mentioned about the abnormal reading. I can't recall, but I would probably have just said the make was higher.

In the context of explaining how it was you came to be there doing these things you may have mentioned it?-- I may have, but I doubt it.

And that you had discovered nothing, it was normal?-- Yes.

And that your opinion and that of MacKenzie-Wood was it's the method of mining or may be?-- May be.

Can I just pause there for a moment? You've had a number of suggestions put to you if you knew this and if you knew that and if you knew about smell. Let's put the reverse one for a moment. If you only knew what you knew that day, you didn't know about the occurrence of a smell and someone had reported one, and you didn't know about any problems with ventilation, those two things, you just knew there was a normal panel and you went down and you saw and did what you -----?-- Yes.

It's a perfectly reasonable conclusion, the one you had, isn't it?-- Yes.

We can see you reached that and you had some concurrence from an expert in the field?-- Yes.

Albeit that he didn't know perhaps as much as you did?-- Right.

So the conclusion that the higher than normal CO make might be ascribed to the mining method, in the absence of any abnormal knowledge, knowledge of abnormal features, smell, whatever, that's a perfectly reasonable conclusion to reach?-- Yes.

Whether in truth that's so, maybe experts in the future will determine that when they go and investigate that and get governments grants and the rest?-- Exactly.

On the state of knowledge at the moment that's a reasonable decision or conclusion to reach?-- Yes.

When you were at the mine and you were going to investigate this reading and so forth, you didn't consider it necessary obviously to browse back through deputies' reports or undermanagers' reports or things like that?-- No.

It wasn't really necessary for a valid investigation by you, was it?-- Well, I have no statutory authority to do that anyhow.

I know you don't have any statutory authorities, but you would have no reason to think that if you asked to see things they wouldn't be shown to you?-- Yeah.

Here they were showing you all their graphs after all?-- Yes.

You get on perfectly well with George Mason and all the men over there?-- Yes.

Without wishing to embarrass you, they hold you in high regard and if you said, "Can I see the reports?", there is no question they would have given them to you, is there?-- No.

Questions of statutory authorities, it's just a red herring, let's not talk about that any more. You didn't really think it was necessary to properly investigating that you look at those things?-- No.

That's the truth of it, and likewise you didn't think it was necessary to your proper investigation that you conduct some cross-examination of people about the history of the panel?-- No.

And that, given your state of knowledge, was a perfectly

appropriate and reasonable approach to take?-- Yes.

And as a matter of your experience and your qualifications, you would hold the view that that's a perfectly appropriate and reasonable approach to take?-- Yes.

Do I understand your background correctly when I suggest that you are one of the people, and I don't mean to say you are one of the old brigade or the old school, but you are certainly one of those people who believes in going and testing things yourself and trusting your judgment?-- It is no substitute for going down the pit and having a look.

And that is certainly a view that may have been conveyed by you in teaching to your Mines Rescue people?-- I would say so, yes.

There is absolutely no substitute for getting down there yourself and checking it out yourself?-- That's right.

There are obvious reasons for that, aren't there? The question of the veracity of what people say comes into question?-- Yes.

I don't mean necessarily whether they are telling the truth or not, simply whether they are accurately describing things?-- Yes.

Whether they are accurately describing smells?-- Yes.

That one that I have just mentioned is a particularly difficult one, isn't it?-- Yes.

I mean, as much as the literature tells us that smells indicate certain things, there are difficulties with smells, aren't there?-- Yes, experience has shown that everyone has a different perception.

You yourself, I think, would find it difficult to describe smells?-- Particularly that smell, yes.

We are talking about a benzene smell. Is that what you are referring to?-- The heating smell.

That's what - the literature talks about benzene?-- Yes.

Have you ever smelt benzene?-- No.

If I said to you, "Describe to me a benzene smell.", in reality you can't?-- No.

Unless you have actually smelt something you know is benzene, how on earth could you possibly use that as a description accurately?-- You can't.

Likewise, if you had never actually smelt various other things that we talk about in mines, you couldn't accurately describe the smell?-- No.

That doesn't mean to say that you haven't smelt something or that you might apply the wrong description to it or your best shot?-- That's right.

No-one is suggesting that people lie about these things?-- No.

But there is a difficulty if you are in a managerial position or any supervisory position - there is an inherent difficulty in your ability to rely on reports?-- In that respect, yes.

Which is exactly the underlying basis for your practice and the practice of other people, very good practice, to go and check it out yourself?-- Yes.

If I can then bring you into the old brigade or the old school, the corollary of that is that you would tend to trust your own judgment too?-- Yes.

And that is a quite reasonable thing for an experienced person to do?-- Yes.

Now, in terms of one of the other indicators, that's haze that has been mentioned here, there are all sorts of hazes, aren't there?-- I don't know about all sorts. Are you talking about underground?

Yes, I am sorry, I should have made that clear. Yes, underground. You might have, for instance, a fine dust haze?-- Yes.

That is either coal dust or stone dust or a combination?-- Yes.

And it could be full of particulate matter or it might not be?-- Well, dust haze is particular matter, isn't it?

Perhaps I am getting more to the size in microns of the particles. It could be heavy or it could be light?-- Yes.

Or indeed Tecrete dust -----?-- Yes.

----- might produce that sort of haze, or you could get a haze from diesel fumes?-- Yes.

Or you can get a haze that is truly the product of some sort of heating?-- Yes.

And they have different appearances?-- Yes.

The haze you experienced in 5 North, for instance, you are able to describe reasonably well because you saw it?-- Yes.

And it layered?-- Yes.

And it had a - what was the appearance of it? It was whitish, wasn't it?-- White-ish/grey in the beam of a cap lamp.

Now, your experience would tell you that that sort of colour and that sort of behaviour is what you might expect from a heating haze?-- On that occasion it was, yes.

Well, no doubt if we experienced a million heatings, we would have a million examples of what to look for, but we only go on what we know, don't we?-- Yes.

Now, diesel haze doesn't always look like that, does it?-- No.

It's got a blue-ish tinge to it in a cap lamp?-- More general body.

In other words, it wouldn't layer like the heat haze did?-- No.

It would be general body haze?-- Yes.

Now, can I go back to the course that you conduct or have conducted for some time for a moment? You in fact hand out to inductees a copy of the Strang and Mackenzie-Wood book?-- Yes.

But I think it's the earlier edition, not the later one?-- The first one, yes.

You have got a store of old ones you want to get rid of?-- Yes, it's too dear to buy the new ones.

That's handed to people, and if they can read, no doubt they will read it?-- Yes.

And you urge them to read it?-- Of course.

And it contains various passages in it to do with the topics that we have been discussing, indicators of spontaneous combustion, various ratios and use of indicators such as CO make?-- Yes.

And in reality, when you look through that edition of the book, CO make only gets effectively one little paragraph, doesn't it?-- I'll have to take your word for that one.

I might show it to you. It's page 257. I will just hand it to you. Here we go. I hope I am not trespassing on someone's copyright. In fact, I will get you to go back to 255. There is a heading on the right-hand side, "Detection of a Spontaneous Heating". That's the first discussion of detection, and it then goes into things like Graham's ratios and the like?-- Mmm.

And gets on the next page, 256, to the Graham's ratio in particular, discusses how it's done?-- Yes.

And then gets onto CO make and the significance of it?-- Mmm.

And that's on 257. In fact, CO make doesn't get much of a run

in this book, does it?-- No, not in terms of a lot of words, but the figures are there, aren't they?

Exactly. If you were reading this book, you wouldn't come to the conclusion that CO make was the be-all and end-all of detection, would you?-- I don't know. That would be a personal perception.

Quite. One could be forgiven if one was a miner for reading this book and you got that far through the book thinking, "This is just one of a whole stack of other things."?-- This book is used in conjunction with a lecture on spon com as well.

I understand that. I am not talking about what additional information you give, just in this book?-- Yes.

Just one of another feature. In respect of 257 in respect of what they say about CO make, all they really say is 10 litres of production - you see the part that I am reading from - 10 litres of production per minute requires investigation and 20 indicates considerable danger exists?-- Mmm.

Reading from this book you would conclude that if you reached 10, it wasn't time to panic and go running around?-- No.

All you had to do was really start investigating a little more than you had been?-- Yes.

It really gives no guidance as to what to do at any point between 10 and 20, does it?-- No.

One might infer that you keep investigating?-- Yes.

But it doesn't really say having reached 10 then when you get to 15 this follows or that follows or anything else happens?-- That's right.

That would pretty much reflect what you told them yourself in the course?-- Yes.

"These are the two parameters: at 10 you investigate, by the time you get to 20 there is trouble."?-- A continuing rise from 10 would indicate that you would probably have a heating.

Well, there is nothing you told people that says, "When you get to 12 it's this or that, when you get to 15 do this or that."?-- No.

In that sense no guidance is given in the Mines Rescue training as to the reactions that are appropriate at any particular level?-- That's right.

And it's reasonable to say, isn't it, that what follows from that is that you have never seen it necessary to develop that sort of indicator warning system as part of your approach to CO make?-- No.

And unless something else had happened, some other training

was given, none of those persons who went through your training would have received any message but what we have been talking about?-- That's right.

And certainly in discussing CO parts, as you had, and CO make, you also gave them to understand that if you get a sudden rise, then that is cause for something else?-- Yes.

Just as you could see on those graphs, you get to a point and it then takes off?-- That's right.

Now, let's stay back with the course for a moment, if I may. Some two or three months before this incident you had six inductees from Moura No 2?-- It would be in June, I think it was, yes.

You took the numbers up to that 38 on the list that you were talking about?-- Yes.

And what happens with the inductees is that you tell the mine manager that you want some people to come as inductees?-- Yes.

They then let that fact be known and people put their hands up and say, "Yes me" or "Not me", as the case may be?-- Something like that, yes.

Now, that training for an inductee is run over two weeks?-- Yes.

And when we say an "inductee", this is an inductee into Mines Rescue?-- Yes.

And there is a big practical emphasis in that two week course?-- Yes.

Not so much theory but getting out and doing things?-- Yes, particularly in relation to wearing oxygen breathing apparatus.

Because your members are people who will be called on first in an emergency to undertake quite arduous tasks and risk themselves down below?-- That may be the case, yes.

Which is why you don't have management in the Mines Rescue, because you can't afford to have your control team being pulled away on the rescue operation, you need a control team and the management will be part of that?-- That's correct.

So, you wouldn't expect to find managers, superintendents and things doing your course?-- That's correct.

Now, inductees are given that Strang and Mackenzie-Wood book?-- Yes.

So, quite apart from deputies' courses and everything else, inductees to Mines Rescue get that book and they also get some teaching on spontaneous combustion?-- Yes.

Physical indicators of it?-- Yes.

Not the gas analysis side?-- Yeah, that would be touched upon as well.

And CO make and how to do it?-- Yes.

And you would also explain to inductees the things you know from your own experience?-- Yes.

What a heat haze looks like, for instance?-- Yes.

And your description of that to inductees would have been as we have discussed today?-- Yes.

It layers, it looks white, white-ish/grey?-- Yes.

Now, since '86, I think I am right in saying, you have been conveying that information about that haze you saw?-- I would have been, yes.

To all your inductees and your retraining people and so on?-- Yes.

So, in so far as anyone who hadn't actually gone through anything like this was concerned, the indication they had from you what a haze might look like is in the terms we have discussed?-- Yes.

Now, can I just go back to that refresher training aspect for a moment? I wasn't quite sure what it was you were indicating yesterday when you said you weren't involved in refresher training. There is some but you don't do it; is that what you mean, or there isn't some?-- No, I have never been involved with refresher training for mine personnel except in the use of self-rescuers.

But does that mean there is no retraining in other areas?-- I have no idea.

I mean through Mines Rescue I am saying?-- That's right, not through Mines Rescue, no.

So, for the old school deputies who haven't been brought up through the new deputies' course by you and got their qualifications ages ago, there is no program that you know about to actually bring them up and re-educate them?-- Not that I'm aware of.

You have been, because of your position, in very close contact with the Mines Department over the years?-- Yes.

Things you discuss are what do we teach people, Mines Rescue matters, state of knowledge, state of education?-- Yes.

You have never heard it suggested by them, that is, the Mines Department personnel, that there should be such a re-education course for the old school deputies?-- I couldn't answer that specifically.

So far as you are aware, no-one has made that suggestion to you?-- Not formally, no.

Or even informally?-- As I said, I can't answer that specifically. It may have been discussed or it may not have been, I can't remember.

It certainly doesn't stick in your mind, does it?-- No.

Likewise, for those deputies educated in the parts per million days before CO make assumed its importance, it's never been suggested to you by people at the Mines Department that those people should all be gathered up, brought in and re-educated?-- No.

Might I just ask this question: the same thing applies to the union officials; no-one from the union suggested to you that their old style members should be gathered up and re-educated to bring them up to scratch?-- No.

So far as you are aware, the union doesn't even have a training program, does it?-- Not as far as I am aware, no.

The union doesn't have a training program for deputies?-- No.

So far as you know, the union doesn't give either their miners or deputies information in booklet form like you do?-- No, not that I'm aware of.

Or seek to train them?-- Not that I'm aware of.

And to you - certainly so far as you know, they have never made the suggestion to you that Mines Rescue should reach down and bring up those people who haven't been brought up in the days of CO make and re-educate them, bring them up to speed?-- Not that I'm aware of, no.

Now, the Mines Rescue Brigade or the whole system of Mines Rescue is industry funded, isn't it?-- Partially, yes.

And all of the coal owners contribute to it?-- They contribute one-third of the cost.

They have a vested interest in doing so obviously because they train people who will help them in emergency situations?-- Yes.

In terms of the training of people through Mines Rescue, would the sort of percentages of people you had from Moura No 2 be indicative of the percentages of workforce across the mines?-- I think at Moura, probably because of the smaller number, our percentage was a little higher.

Moura was above the average in terms of -----?-- I think on the last statistics I looked at it was slightly higher, but not much.

That's all right?-- Yeah.

But it's a significant proportion of the workforce, isn't it?-- Yes.

And significantly covering all levels of the workforce?-- Yes.

And that's reflected in other mines?-- Yes.

Across the levels and in terms of proportion of the workforce?-- Yes.

There couldn't be any question, could there, that you have been working or keeping in contact with management about Mines Rescue matters?-- In what respect?

I don't mean the day-to-day matters, I simply mean in terms of training personnel and keeping the numbers up, you obviously have to liaise with management to make sure the numbers are up and you get the inductees?-- Yes.

So, there is no question that management at No 2, for instance, as no doubt at other mines, are aware that a significant proportion of their workforce are Mines Rescue trained?-- I would assume so, yes.

And they have some idea of the sort of training you give them?-- Yes.

They must do because some of those people go on to become undermanagers?-- Yes.

Squires, for instance?-- Yes.

Trained before he became an undermanager and then stayed in the brigade?-- Yes.

No doubt there are others, McCamley perhaps?-- Yes.

So, from a management point of view, from the point of view of management at this mine and no doubt other mines, they have the knowledge that their workforce is - is/are - Mines Rescue trained and that that involves areas of spontaneous combustion, CO make and so forth?-- Yes.

Now, when you teach people about the CO make and the indicators of spon com and so forth, that's all theoretical stuff?-- Yes.

There is no way you can take them down and put them through a spon com incident?-- No.

You probably might not want to - I don't know - but you can certainly give them practical exercises in doing CO make, for instance?-- Theoretical exercises, yes.

And practical. People have to stand in a sort of a doorway with a fan going, take a calculation, take anemometer readings and that sort of thing?-- In that respect, yes.

But the theory is far removed from the practice, isn't it? It is a different thing entirely to sit down and look at the theory. If you are actually in the position of having to do it, it is a different matter entirely, isn't it?-- If you are taught how to do it anywhere, you should be able to do it anywhere else, shouldn't you.

What I'm getting at is when you are in the pit, there are so many things to take into account; it is not just these little technical indicators out of a book. There are a lot more things going on and a lot more factors to take into account in making judgments?-- Not when you are talking about CO make.

Well, if you were investigating signs, for instance - like smell?-- Yes.

There are a lot of things you have to do and take into consideration?-- In addition to that - in the final analysis?

Yes?-- Yes.

A whole host of things which may weigh this way or that way in terms of making a determination?-- Yes.

And it is a balancing task in the end?-- Yes.

In respect of which one has to make a judgment?-- Yes.

And different people, given the same circumstances, might make different judgments?-- Yes.

And given their data - given one set of data - people can legitimately take different views of what that data means?-- Yes.

It is not unknown for scientists to disagree as to what data means, and certainly par for the course for lawyers to disagree about what things mean?-- Yes.

And same with mining managers?-- Yes.

And it doesn't mean one is wrong or one is right; what it simply means is that, reasonably, each has a different view?-- Yes.

So, the fact that someone decides this way as opposed to that doesn't mean he has made a bad judgment or anything else, it simply means that he has made a different analysis?-- The

final analysis might be - might prove that it would be a bad judgment.

Yes, but it is not unreasonable at the time, that's what I'm saying?-- No.

You have never been confronted - be grateful for it - you have never been confronted with the reality of considering the signs and making up your own judgment about them?-- No, not in the final analysis, no.

It is an unenviable position to be in, isn't it?-- Undoubtedly.

So far as you have been associated with it, it is only after decisions have been made - like with 5 North - where things are happening, someone has bitten the bullet and made the decision?-- Yes.

If I can take you back to one area we were discussing before: if one investigated one of the indicators - smell - there are a lot of things you would weigh up in assessing that was an accurate report - it really meant what it might mean?-- Yes.

A lot of things - for instance, what you might take into account and others might is who gave you the report in the first place?-- Yes.

Is it some person who had experience in that field, or was it some new inductee, was it some fellow who didn't know what he was talking about, was it some experienced person, even that you would weigh?-- Yes.

Then you might weigh whether it was repeated?-- Yes.

For instance, in this case, we have a report of a smell which the relevant deputy has described in his evidence as a very faint benzene smell?-- Mmm.

It was there and gone. But that was investigated and not repeated - not found again, even though people went to the same spot for shift after shift after shift over the next significant number of days?-- Yes.

That's the sort of factor that one would weigh in assessing just what that smell meant - what it signified?-- Yes.

And you would weigh also this factor: if that deputy who said he got that smell himself started to doubt whether he really got it-----?-- Yeah, that may sway you, yes.

-----it is just a factor?-- Yes.

We are discussing simply - I don't say any of these are determinative - what they are are factors one would have to take into account?-- Yes.

What one would reasonably take into account?-- Yes.

We will deal with another one. If the person who reported the smell had been known to label a chemical roof bolt smell as benzene before, you have to weigh that?-- Yes.

So, you would weigh it heavily this way or that, but you have to take it into account?-- Yes.

And if someone reported a smell, be it tar or benzene, and then very experienced people went to the same place, or essentially the same place, and could not detect the same thing, that's a factor you would have to weigh?-- Yes.

And if you very much respected the views of those who went there and said, "Look, that smell is just not there. I can't get it.", then you would weigh that even more heavily in your judgment?-- Yes.

And what I've been describing to you, none of those approaches is unreasonable to take, is it?-- No.

In fact, it is appropriate to weigh those things?-- Yes.

Likewise, with a haze, for instance, if one gets a report of a haze, it obviously matters what the description of it is?-- Yes.

If someone said a description like you had - white, grey and layering near the roof - then that to you would mean something?-- Yes.

Something, particularly in view of your experience of 5 North?-- Yes.

But if someone said to you - reported the haze and then said it had a bluish tinge and it was probably from diesels, that's another factor you have to weigh?-- Yes.

And then if the haze went away, it is another factor to weigh?-- Yes.

And if someone very experienced went there about the same time and couldn't even detect it, that's another thing you have to weigh?-- Yes.

And again, weighing them all, balancing one with the other and making a managerial decision, that's a perfectly reasonable approach in your experience?-- Yes.

In fact, very sensible approach?-- Yes.

If, say, those features - smell and haze - occur, certainly your experience and conduct would lead you to go down and check it out yourself?-- Yes.

You would sort of pay heavy regard to your own findings?-- Yes.

And that also is a reasonable thing for a management person to do - first inspect, secondly pay attention to his own

experiences?-- Yes.

The non-repetition of any of those indicators - and let's deal only at the moment with smell and haze - they seem to be the two that are mentioned most of all - the transitory appearance of either of those, and then the non-repetition of that indicator for quite some time, that's a feature that one weighs in assessing the impact and meaning of what that sign has?-- Yes.

And one could reasonably hold the view that if smell occurred new and wasn't repeated, even though experienced persons went to the same place, or went to investigate, that the cause of it had either gone away or it was under control, or it was transitory?-- Yes.

And that's a reasonable judgment to make?-- Yes.

An likewise with the haze. If it is there and assessed to be possibly or probably the product of diesel and then goes away and experienced people who go to the same place find there is no haze, then it is a reasonable judgment to make in your experience that whatever caused that was either diesel or it's gone?-- Yes.

Can I come back to 22 July for a moment - the day you went down with Abrahamse and Atkinson? You went off to get the tubes from Mines Rescue. You obviously didn't think it was necessary to bring back the Multiwarn?-- No.

You would have had to charge it up anyway?-- No, it is always ready to go.

Is it?-- Yes.

Is it always calibrated with the span?-- You have got to calibrate that prior to use.

It is a pain in the neck, really, isn't it, in that sense? You can be candid. This will guide us for the future?-- Yes, obviously if you can pick up something and use it immediately without any preparation, it is better than something that you do have to.

And that's the big advantage of a Drager. It is there ready to go if you have got the strength to pump the pumps?-- Yes.

When you came back, you didn't consider it necessary or appropriate to bring the Multiwarn. The Dragers were sufficient for what you were doing?-- I believe the first step in checking any abnormal gas reading is to use the same instrument that the reading was taken with.

And having made your inspection, you conveyed your view to Jacques Abrahamse, even down the pit, that there was nothing abnormal?-- Yes.

And likewise that view was conveyed to Reece Robertson, the section deputy?-- Yes.

May I pause there for a moment? When you were down the pit, you didn't think it was necessary to your investigation to ask whether smells had been experienced?-- No.

And likewise you didn't think it was necessary to ask Reece about that, nor did he volunteer anything about that?-- No.

In fact, he said, for his part, that he had got readings that coincided with yours?-- Yes.

The face at that point was - can you remember roughly where? You can turn the map over if you need to?-- I can't remember which row of pillars it was.

Okay. The cutting was going on?-- Yes, they were mining bottoms.

Sorry, mining bottoms. And when you came back up out of the pit, you conveyed that opinion to George Mason?-- Yes.

Was anyone else there, like Joe Barraclough or Albert Schaus? It was just George Mason?-- George - I was talking to George in the lamp room.

Perhaps what you conveyed to him, perhaps in one of your own manners of speech, was that everything was "sweet"?-- Nothing had changed.

And did you discuss with him at that point what might be done for the future?-- Yes. George indicated that monitoring would take place on a more frequent basis.

Now, that's about all that was said, I take it?-- Yes.

You didn't discuss the details of what monitoring or how it would be done?-- No.

You may have even made the suggestion of more frequent monitoring down the pit to Jacques?-- May have.

So, you thought, quite reasonably, that that was the appropriate response in the circumstance?-- Yes.

And you didn't think it necessary, or even appropriate, to do the calculation of make which followed from your reading?-- No. My position was nothing had changed.

Your reading, in fact, coincided with the Unor?-- Yes.

And you must have been able, as most people who are familiar with CO make are, to have an idea of what it would calculate to roughly?-- No, I had no idea what it would calculate to. I was still using the basis of that average of about 8, but nothing had changed in regard to CO content in parts per million.

And when you left the mine, certainly it was your view, from your physical investigation, that there was no reason to think

there was a heating?-- No.

No reason to think there was anything abnormal?-- Other than the higher than normal make, no.

And no reason to do anything more than had been proposed to do - monitor more closely?-- Not at that time, no.

Now, it was yesterday suggested to you that - or you were asked for your view about whether it was good or bad practice that the readings would cease to be taken midway through the following week, and you said, "Oh, that would be bad practice."?-- Yes.

By "readings", you mean taking the CO parts, an anemometer reading, wet and dry bulb and all the rest of it?-- Yes.

Now, in reality, all of those readings were taken right up to the date of the explosion. Now that, you would say, was good practice?-- Yes.

And, in fact, on the following week, whether it was the Monday or Tuesday, you spoke to Steve Bryon. He told you that some of the readings had been taken and gave you some idea of what had happened?-- I don't recall that.

Could have been the case that he spoke to you and said that, you know, "We are taking the readings."?-- Could have done.

"Everything is still all right."?-- He could have said that, yes.

You may have had conversations with others, to the same effect, from the mine saying to you, "The monitoring is ongoing."?-- I don't recall that, no.

But it is possible?-- It may be possible, yes.

When you left the mine-----

WARDEN: You have got some way to go?

MR MORRISON: I have.

WARDEN: It might be a convenient time to give the witness a spell. It would be a convenient time to have a short break.

THE COURT ADJOURNED AT 10.56 A.M.

THE COURT RESUMED AT 11.16 A.M.

DAVID CHARLES KERR, CONTINUING:

MR MORRISON: Mr Kerr, I was asking you about the 22nd, can I just stay there for a moment, if I may? When you had concluded your investigation that day what were you thinking - or what were your conclusions as to the explanation for Steve Byron's reading of eight parts?-- I give it a most likely cause as a plug of CO from some other source was there momentarily.

Although that runs into the problem of if he took his reading -----?-- Right next to the monitor it should have showed -----

----- monitor point, you would expect it to be on the Unor, wouldn't you?-- Yes, but it was only a very small plug.

It would have to be very small, wouldn't it?-- It may have been, yes.

You are no doubt aware that some of the literature on this topic, that is to say readings and so forth - might even be Mr Mitchell's literature I'm not sure - refers to the fact that you can get a rogue reading. This could be one?-- Maybe.

And those rogue readings should be, if they bear that characteristic, should be, in terms of analysis, discounted?-- Yes, if it can be proven.

Quite. If you've got an endless trend of sixes and somebody someone popped up with 10 and couldn't be verified by the Unor and all the rest of the things we have been discussing it's likely it's rogue?-- Yes.

The important factor is it's not truly representative?-- That's correct.

On the day, that's the 22nd, when John Blyton told you about this high reading, he didn't actually express any concern to you about it?-- No, it was just that there was an abnormal reading.

Nor did he say anything to you about dissatisfaction or concern about the trend of the CO make?-- No.

In fact your conclusion was, as you express in your statement, that when you did the comparison of the graphs the trend for 512 was the same as the trend for other panels?-- Yes.

Albeit it was running at a higher level?-- Yes.

After the 22nd - I've suggested to you that a couple of people

may well have talked to you or mentioned to you the readings that they had been getting and you say you don't have a good memory of that or any memory of it, but it's possible?-- I can't recall any conversation about that.

Can I suggest to you three specific persons? Reece Robertson told you about his findings?-- That was on the day.

No, I'm suggesting to you later?-- No.

Atkinson might have talked to you?-- I doubt it.

Okay. Could you have made the suggestion to Atkinson on the day that there be these extra readings, shift readings?-- We may have discussed that before we went down the pit.

He was undermanager on shift?-- Yes.

So that would be a natural topic for you to discuss with undermanager on shift?-- He was part of the discussion for some time in George's office.

And Steve Byron on the following Monday, you had told him about the results of what you had found down below and also told him about your conversation with Mackenzie-Wood and Mr Lyne?-- Yes.

And also told Steve Byron your view that there was nothing abnormal?-- As far as I could see, yes.

Now, after the 22nd you yourself didn't think it necessary to go and check the results?-- No.

And no-one said to you that there was any ongoing concern or any problem?-- I had no further involvement with the 512.

Notwithstanding that there was no doubt you would have had contact with brigade members from that mine over those days?-- I may have.

Certainly Steve Byron?-- Certainly Steve, yeah.

Now, can I just touch on one last point before we move on to something else? In your discussion with Mr MacKenzie-Wood you said you and he agreed on the likely explanation for what had been shown. Can you confirm for me that the context in which you discussed it was that the CO make that was being exhibited could well be the normal for that panel?-- Yes.

I just want to touch on one last thing. We have heard from time to time here about the potential possible impact of barometric changes on ability to detect smells and so forth?-- Yes.

I just want you to have a look at something. On the day you were out there, that's the 22nd, I would just like to show you the record of barometric pressures. Now, you will see - I can just tell you that's a graph of the barometric pressures taken at Rockhampton. We will go to the 22nd. You will see the

start point for the 22nd is directly above the seven?-- Yes.

Do you see that?-- Yes.

The start of the day by comparison with the next line which is midday?-- Yes.

It runs midnight to midnight, start of the day high pressure, by the time midday came it was dropping, then by mid afternoon it was the lowest of any point for that day?-- Yeah.

And by the time you were in there it had risen slightly from that but was still substantially lower than the other part of the day, wasn't it?-- Yes.

So in terms of - if we look at that day you were there at a time within that span of that day, low barometric pressure compared to the other part of the day?-- Providing that chart is relevant to Moura.

Quite. I don't think they have a barometric station -----?-- They have a barometer at the mine, yes.

Let's assume for the moment that whilst the actual figures may have changed the trend will be the same?-- Normally the barometric pressure follows that trend. It would be falling in the afternoon.

Quite. Can I just ask you to look at one other point? If we look at the second page, barometric pressures over a different period of time but taking into account 6 August, you will see the fourth marked there. Go two points after that to the sixth?-- Which page are you on?

I am sorry, the second page of the document that you have. Do

you see that that covers 14 July through to 11 August?--
Yes.

Now, you can see 4 August?-- Right.

Go two points on the bottom axis?-- Yes.

To the 6th. You might use a straight rule or something and go up, and I think you will confirm that on the 6th it was again high pressure in the morning, low pressure in the evening?--
Yes.

I tender that document. It's a graph of barometric pressures and attached to it at the back, though I won't take the witness to, is the base data for the graph.

WARDEN: Admitted and marked Exhibit 151.

ADMITTED AND MARKED "EXHIBIT 151"

MR MORRISON: Now, you were asked yesterday to consider a number of CO make readings, 14.27, 18.94 and 21.04. Mr Clair asked you to just consider those three and what would it signify to you if you had this, this and this reading. Now, they were for Friday, 5 August, the 14; Saturday, 6 August, the 18; also Saturday, 6 August, the 21. Now, just accept for the moment, if you would, that those CO makes actually weren't calculated; the figures were available, the readings had been taken, but no-one had calculated them and considered them as CO make. Now, you were asked to do something that no-one else was asked to do in that sense. Now, there are a number of factors that could impact on whether any particular point reading is significant or not?-- Yes.

And in fact would you agree - I think you do, the literature suggests so - that point readings are not in themselves significant, it's trends that matter?-- Yes.

And there is information that one could get or take into account which may or may not, as a matter of judgment again, impact on the accuracy and veracity of that sort of reading?--
Yes.

An obvious one is if someone has mucked up the velocity?--
Yes.

An equally obvious one is if someone has mucked up the CO parts?-- Yes.

And if deputies were taking their parts reading in the place Steve Byron did, that is, in close proximity to the Unor monitor point, then we would expect the readings to coincide, assuming they were doing their readings properly?-- Yes.

And if you had a significant divergence, as with that one on the 22nd, an explanation of that in those circumstances, it's a rogue reading?-- Yes.

Now, can I just ask you to just look at this document for the moment, just by way of assisting you? Now, you were asked to look at three figures, 14.27 on Friday, that's the first one. You see that's under subparagraph (a) on the document I have just handed you?-- All right.

Let's go down to consider paragraph 1 on that page. Now, you weren't told, but it's the case that on three of the previous four shifts - you can see what I am reading from in the second sentence - the reading had been 16.57?-- Mmm.

And on the second of the previous four shifts 15.65?-- Mmm.

On the previous four shifts the parts per million of CO had not changed from 7?-- Yes.

That reading was not based on 7. Just let me pick it up for you. That reading was of - that reading - sorry, I think - well, I am not sure what that reading was based on. So, the 14.27 was a marked decrease from the previous shifts, the four or so shifts?-- Yes.

A marked decrease, and the 7 parts - you can accept for the moment that that reading was based on the 7 parts?-- Yeah.

But it was a much lower velocity reading, 1.55 as opposed to what everyone else had got on the previous four shifts?-- Yes, and that would make a difference to the result.

That's a factor that would impact on the accuracy and veracity of that reading of itself?-- Yes.

Okay. Assuming no outward changes to ventilation, that he got 1.55 as opposed to everyone else getting 1.8 might suggest there was some difficulty with the reading?-- It may do, but nothing had changed.

I am not saying it does. It's a factor that may impact on the veracity?-- Yes.

And the anemometer reading is something one can easily muck up, isn't it?-- Not so much muck up but get variance in readings between different operators.

I am sorry, I am suggesting the wrong thing to you. I mean people with all the best will in the world can produce variations?-- Yeah.

Based on their own conduct?-- Yeah.

Now, the velocity readings - assume for me that the next sentence is correct - the velocity readings from at least 1 July, that's right up to 5 August, had been taken and on no occasion had they gone below 1.68 except once when one fan was going. In other words, when ventilation was normal, it had

never got below 1.68?-- Right.

1.55, if accurately measured, was an exceptionally low velocity; you agree?-- Certainly different, yes.

What I have just suggested to you impacts on the degree to which you can rely upon the 14.27 litres?-- Yes.

Now, the second figure you were asked to look at was 18.94 at 12.45 on Saturday, 6 August?-- Yes.

You see that's mentioned in (b)?-- Yeah.

At the top of the document. I can tell you, and you can see, I think, when you look at the third page, it consists of the schedules of the actual readings. Look down towards the bottom of the page, I think it's the third one up, 18.94, and the data which went into it. Now, that was based on a velocity of 1.8. That was an increase from 1.55, but by the next shift was back down to 1.6 for no apparent reason?-- Mmm.

In other words, there were no major ventilation changes, and it's based on a Drager reading of 8 parts, that calculation, that is?-- Yes.

Now, the deputy in fact wrote 7 to 8, not 8, and that reading has taken the highest reading?-- Right.

If one went to the 7th you would have a drastically different figure?-- It might alter by 2 or 3.

Well, you can see - we have done the calculation for you - it's going back to a previous occasion back a couple of points down to 16 and a half instead of 18.94?-- Yes.

So, what I have just suggested to you, if correct, affects the way in which you can accept or reject the veracity of that reading; would you agree?-- Yes.

And they are matters which one would have to take into account in considering the impact of those readings?-- Yes.

And whether they truly reflect a trend or anything else; would you agree?-- Yes.

Now, the third reading you were asked to look at was a figure on 6 August, 21.04. You will see that on the third page in the schedule - it might be the fourth page - 21.04 on 6 August and the Drager readings and the Unor readings are given next to it; you see that?-- Yes.

In respect of that reading, that was a velocity of 1.6 but the calculation has been done on 10 parts, a parts reading which is not verified at all by the Unor?-- Mmm.

And if, as we have been talking about, that deputy did his reading near the Unor point, then that suggests that he has - there has got to be some other explanation for his reading?--

Yes.

There was, if you look at paragraph 3 on the second page that I have taken you to, on no occasion in the previous day did the Unor read 10, at no time. The first time it reached 10 was 10 hours later than has been suggested to you at about 8 p.m., by which time you were told that it's the case the top return and the second heading intake had been fully sealed, almost fully sealed, and the belt road had been sealed. So, there were at that time alterations to ventilation by those factors?-- Yes.

And there were other ventilation changes at that time: a regulator had been interfered with for a legitimate purpose, bringing materials through, but it had been interfered with, and a man door had been left either open or partly open. Those things affected ventilation. So that would you agree with me, if what I have just suggested to you is accurate, they are all factors which would impact upon legitimacy of this reading of 21.04?-- Yes.

And can we add to that, if you like to look further down on the page that I have directed your attention to, the deputy who took the reading of 10 acknowledges then and now that when he took it there was a significant amount of diesel smoke about him caused by the operation of machinery which I have listed for you. That would have an impact?-- Yes.

Likewise, the vehicles were moving in and out of headings moving machinery and the like?-- Yes.

They themselves, by that very fact, would act for that period of time as a mobile regulator?-- Yes.

That would have an impact too?-- Yes.

And that deputy was the same deputy - you were asked to link these readings to perceptions of a haze - that deputy was the same one who observed the haze which he described as diesel fumes being carried towards him out of the return. That's a factor which would affect the veracity of that reading?-- Yes.

And that perception of haze?-- Yes.

And how one would treat it?-- Yes.

When that deputy came back - you can go to the third page - just over an hour later, took the readings again, all he got was 7 parts and he did not again get 10. That's a factor you would have to take into account affecting the legitimacy of the 21.04?-- Yes.

And if one looked at the reading he got, that 7, it gives you a dramatically different figure, isn't that so?-- Yes.

Later in that same day calculations were made of CO make, or readings were taken which, if they had been calculated for CO make, would have produced figures - I'm sorry, I will start

again. Yes, I'm not putting this correctly to you, this bit, but I will start again and do it right. What it says in subparagraph (d) is correct, later that day a calculation was made by a deputy of CO make that was back down to 16 and 17, a figure in between there, the same as it had been on previous days. That's a factor which impacts on the legitimacy of the 21.04?-- Yes.

Now, you can also see in the last point that I mentioned to you that in terms of what you were asked to look at, what was the significance of these points associated with sightings of haze and perception of smell, there are other factors that might be taken into account, and had you been told, you might have adjusted your answer about your perception of those things, and that's what I deal with in (e) on the third page. If you look at the last page of the whole document you will see what I am demonstrating for you. The Graham's Ratio as graphed is flat. It only showed an increase after the sealing on 6 August, and even then it only reached a peak of .2, not at any stage reaching .4?-- That's correct.

That is a factor which impacts against the legitimacy of the readings that you have been told about?-- Yes.

And would affect your assessment of those readings?-- Yes.

In relation to Graham's Ratio - this is no doubt something you deal with in the course - what's the significance of 0.4 on the Graham's Ratio?-- Generally 0 to 0.5 is regarded as normal.

This Graham's Ratio never reached outside the normal range, did it?-- No.

Now, if we look again at the fourth page, that's the schedule of deputies' findings and the calculation I have given you, you were asked today to look at or give a view about three more readings, or three readings, and I think we might have dealt with one of them already. The first was 18.35 lpm. You will find that that is Mr Newton's on 28 July. You will see that about point 4 on the page. See that, "28 July, R Newton, night"?-- Yep.

You might like to put a piece of paper under it so you can follow the line across. Don't cover up the CO make column because it is significant?-- No.

Now, if you look back on all of the days before that, and you look forward to the next five or six days after that, that reading is - in terms of parts - not matched at all by the Unor, is it? You have got 8, the Unor is showing at most 6, 6.2, 6.3 on lower; is that so?-- Yes.

If he was taking the reading where he should have been taking it - where Steve Byron took it - there must be an explanation for the 8; it is completely out of sync with the Unor?-- Yes.

So, is the make figure completely out of sync with anything around it?-- Yes.

That could truthfully be called a rogue reading, and a rogue calculation?-- You might make that assumption.

Well, it is a reasonable assumption to make, let me put to you. Even Mr Mitchell, one of the experts in this case, discounts that figure entirely. I will show you the graph he has produced. It is Exhibit G for identification. If you look at Mr Mitchell's graph, which starts on this day, the 28th, he doesn't put this figure in. You could legitimately infer that he has taken the view that this is an abnormal rogue figure to be discounted?-- That's his opinion, yes.

I will have that back. The second figure you were asked to look at is the 18.93 figure you were directed to by Mr Moody on 1 August. You will see that at about point 7 on the page. If you follow it down, "1 August 1994, D Moody"?-- Yes.

Follow the line across. Now, once again, he has got a Drager reading completely at odds with the Unor, and if he took it next to the Unor, it can't be right; would you agree?-- Yeah, it comes back to what you believe, doesn't it.

Well, if he took it next to the Unor-----?-- There is doubt, isn't there?

There is doubt about it?-- Yes.

I would suggest in view of the Unor readings right back about a week or so, and the Unor readings forward, there is considerable doubt about that reading. Mr Moody is just out of sync entirely, would you agree?-- Yes, it is out of sync.

And likewise that has the result that his make reading is out of sync?-- Yes.

And if we just look back one reading, it perhaps doesn't come as any surprise, considering what Mr Newton found on the 28th and how he read the Drager then. Mr Newton has got a higher reading than the Unor too, hasn't he?-- Yes.

And those two make readings around that time are completely out of sync with what went before and what followed after, aren't they?-- Yes.

The last one - yes, I perhaps don't need to take you back to Exhibit 151, the barometer readings, but we can see for the times when those readings were taken that they were periods of very low pressure; in fact, the lowest pressure for some time. That would suggest that this reading has to be readjusted in one's assessment?-- It may do, if you had background information on how much was liberated during a pressure drop.

Yes, it means you don't take them at face value, does it?-- It may need further investigation on that basis, yes.

The last one you were asked to look at was 18.93 on 6 August by Mr Klease. We have already dealt with that one. It is the 21.04 that we have been discussing before based on 10 parts?-- Yes.

We have already discussed the factors that went into that. All of those features I have taken you to, assuming what I've taken you to is accurate, all have a considerable impact upon how one treats those figures, doesn't it?-- Yes.

I tender that document that I asked Mr Kerr to look at while we went through that exercise.

WARDEN: Admitted and marked Exhibit 152.

ADMITTED AND MARKED "EXHIBIT 152"

MR CLAIR: Could we have a description of the document? Who compiled it and-----

MR MORRISON: Well - who compiled it?

MR CLAIR: Has it been compiled by an expert, Your Worship?

MR MORRISON: It has been compiled - I can simply describe it

as a schedule compiled from the evidence.

MR CLAIR: It doesn't answer my question as to who compiled it.

MR MORRISON: It has been compiled by my team - well, read it first, because it is self-evident when you do that it is derived from the evidence in this case.

MR CLAIR: I suppose I'm wondering whether, Your Worship, it falls into the category of an exhibit, or whether it is more properly part of submissions that might be made at some stage.

MR MORRISON: I tender it as an exhibit. It is a convenient summary of what I have just put to Mr Kerr.

WARDEN: It has been referred to in depth by the witness and whether or not you use it in your submissions is entirely up to you.

MR MORRISON: Indeed.

WARDEN: I am prepared to admit it at this stage. It stays as 152.

MR MORRISON: If it allays anyone's fears, the last page is in fact the page out of the SIMTARS report. The prominence of that document, at least, is not mine.

Can I ask you something completely different, if I may, Mr Kerr? There was a gas chromatograph at the No 2 Mine?-- Yes.

Prior to 1986, almost no mines had gas chromatographs. It may, in fact, be the case that none did in Queensland?-- Prior to 1986?

Yes. Very few, if any?-- Yeah, probably that would be right.

And out of the 1986 Inquiry, one of the recommendations that followed that inquiry was that because of the time delay that was experienced in ferrying up a chromatograph from Brisbane and the need to recalibrate it because of the treatment of it on that flight, it would be an advantage for each mine to have its own chromatograph?-- That's right.

You were there when this chromatograph arrived?-- Yes.

And the basis of its use, as with other mines, was something that arose out of the 1986 recommendations?-- I believe so, yes.

And that basis was that in an emergency, no-one, again, wanted to have that time delay of ferrying things up from Amberley. They wanted an on-site chromatograph?-- That's correct.

And as you understood it, its real use, as accepted in the industry, was as an instrument for emergency use so that there would be absolutely no time delay for persons such as yourself

when you were considering sending men down on Mines Rescue?-- That's correct.

Can I turn to the events after the explosion? You got the call, I think, from Michael Squires to come out?-- That's right.

And when he called after the incident, you told him to get - to do something in relation to Mines Rescue personnel?-- Oh, yes, I asked him if there were any Mines Rescue personnel there and, if so, could they begin testing our equipment.

And you said the men available were either the men that had been on the surface during the incident or the men that had come out of the mine?-- Yes.

In reality, what you asked him to do - in fact, in terms, you told him to the get the Mines Rescue men of the 1 North-west crew - to get their rescue sets ready?-- Start testing the gear, yes.

Now, thinking back now, that wasn't a sensible thing to do, was it?-- In hindsight, I didn't realise the trauma those people went through, but, in fact, they had begun to do that without any instructions, to their credit.

Absolutely. Their training and their personalities stood them in good stead?-- Yes.

But the suggestion, in fact, arose from you to get them to do those things?-- Yes.

In terms of between you and Michael Squires; is that right?-- I suggested that to Michael, but I believe they had already started to do that.

I was just asking you about the chromatograph a minute ago, and you agreed with me about the basis of its use having arisen out of those recommendations from 1986. In your understanding, that's the way in which its use was perceived at No 2?-- Yes.

And at other mines as well?-- Yes.

I have nothing further, Your Worship.

CROSS-EXAMINATION:

MR HARRISON: Mr Kerr, in relation to the component of what was taught regarding spontaneous combustion with the Mines Rescue course, I take it that it formed a relatively small part of the initial induction course?-- Yes, it would have done.

That was over a period of 10 days, was it not, that course?--

Yes.

And what was taught in relation to spontaneous combustion may have taken, what, no more than a couple of hours at most?-- That would be right, yes.

I take it that your aim there was to give people a very basic knowledge of the cause of spontaneous combustion and, perhaps, any signs relative to a possible spontaneous combustion?-- That's correct.

You don't profess to be an expert yourself?-- No, certainly not.

Was it the case that that would have probably been the only time that that was dealt with in the training?-- During the induction course?

Yes?-- Yes, it would only be dealt with once.

Would it be fair to say that the overall emphasis on the induction course was elsewhere?-- Yes, the main emphasis is on the ability to wear oxygen breathing apparatus under all simulated conditions plus an understanding of rescue team procedures.

So, a lot of emphasis was placed on the team aspect of it, wasn't it?-- Yes.

And so much so that you concentrated on having an almost military-type precision in terms of how things were being done, or should be done?-- Military-type?

Well, in the sense that you wanted people to react almost as a matter of habit in terms of how they should behave in certain situations?-- That's correct.

And the bulk of the time was spent on that aspect of the training, as well as the use of the breathing equipment, or the breathing apparatus?-- Yes.

In terms of what was actually taught about the relevance of CO readings - and I mean both parts per million and litres per minute of the CO make - was it the case that, as you taught it, the emphasis was really placed on the trend?-- The trends and the parameters as far as litres per minute go.

In terms of the parameters, you are talking about the relevance that you have already mentioned in your evidence of 10 and 20?-- Yes.

Is that basically it?-- Yes.

But in terms of the trend, was it the case that you basically explained to them the relevance of keeping an eye out for fairly steady increases, be it parts per million or be it CO make?-- That's correct.

Now, some of the members of the rescue teams participated in

the Healy Cup; is that right?-- Yes.

That involved testing, in part, in relation to spontaneous combustion, didn't it?-- Which one are you referring to?

The Healy Cup itself. Did some of the testing there involve knowledge in relation to that?-- Yes, it may have done in certain competitions, yes.

How was that tested? Was that tested orally or in writing, or a bit of each?-- Both, yes.

And to your knowledge, how far did the questioning go in that competition in terms of the level of knowledge expected?-- Basically the level of knowledge we expect would be to understand the meaning of the parameters and the trends and to be able to calculate a CO make.

And when you talk about the meaning of the parameters, the fact of the need to investigate 10 lpm, the fact you have got a real problem at 20 lpm?-- Yes.

And you would have expected, would you not, that those that participated in that competition may have had a better knowledge of those particular matters than, say, those that merely encountered this in an induction course?-- That would be correct, yes.

Of the people that regularly participated in those competitions, was Len Graham of one of them?-- Yes.

Was John Blyton one of them?-- Yes.

To your knowledge, what facilities did they have at their disposal in terms of updating their knowledge about matters relative to CO parts per million or CO make?-- I wouldn't be aware of any facilities except what we provided at the Rescue Station.

Would you expect those proficient in that competition in terms of the questions relative to spontaneous combustion to have a knowledge perhaps at least along the lines of what was contained in the passage from the Strang and Mackenzie-Wood book that Mr Morrison pointed out to you earlier?-- Yes.

I have nothing further, Your Worship.

MR CLAIR: I have a few questions, Your Worship.

RE-EXAMINATION:

MR CLAIR: Mr Kerr, I want you first of all to just have a look at some material that's contained in - what, in effect, is a handbook put out by Drager. There is a photocopy that goes with the book which, in fact, isolates the relevant

pages, and I have copies for the panel and for the parties, Your Worship. If you go to page 33 of the book - in the book itself, perhaps, Mr Kerr - and then I'll get you to look at the photocopy just to confirm that that represents what's contained in the book itself?-- Yes.

Page 32 contains some of the features that are to be kept in mind when the Drager tube is being used; is that right?-- Yes.

Going to about point four on the page there you will see a paragraph, "In all cases the entire length of the discolouration must be read."?-- Yes.

"This means the sum of all colours, e.g. carbon monoxide tubes produce light brownish green colours." That ties in with your knowledge?-- Yes.

Have you seen this handbook? Is that one that you've used?-- Yes, we have got this handbook.

The next paragraph, "It must also be pointed out that an individual's perception of particular colour or intensely of a colour is somewhat subjective. It is possible, for example, that one person calls a colour light brown whereas another calls the same colour brown. These deviations in individual perception of colour or sense of colour should not be over-emphasised unless colour blindness is an issue.". That's a feature that you would keep in mind, tell your students about, I suppose?-- Yes. Everyone has their own perception.

Then below that there is a passage that deals with the different kinds of concentration of colour on a scale tube, the options being either colour which ends at a right angle to the tube's longitudinal axis?-- Yes.

Where colour indication is oblique to the tube's longitudinal axis, and the third one, the end of the colour indication becomes very diffuse. I suppose with carbon monoxide the third one might be more applicable?-- The latter is applicable there, yeah.

The directions in that regard are to this effect: "When the colour indication is at a right angle" - I will pass over that to the end of that paragraph. "If the colour indication becomes progressively diffuse the end of the discolouration may be difficult to evaluate. In this case the final edge of the discolouration has to be read at the point where a faint discolouration is just visible."?-- Yes.

That confirms what you were saying yesterday, you read to the very end of the colour?-- Yes.

Is that so? Can I ask you first of all whether the second page of the photocopied bundle represents that page 32?-- Yes.

Can I ask you to go then to page 51 of the book, and I just draw your attention there - there are a number of features set out there in relation to the use of the Drager tube, directions in respect of the number of pumps et cetera, and there is in particular a paragraph there that deals with standard deviation?-- Yes.

Is that so?-- Yes.

Was that a matter that you were conscious of in training people?-- Yes.

And it gives an example as to how standard deviation works?-- Yes.

Describes standard deviation as the measure of the incidental deviations of the indicated values from their mean value. "The standard deviation which is actually a coefficient of variation, that is relative standard deviation, is given as a percentage and relates to the mean value. According to the first confidence interval as it applies to Drager detector tubes, 68.3 of all measured values are within this standard deviation range.", and it gives an example and it talks then about the relative standard deviation as being 10 per cent and then each of the particular tubes has a standard deviation applicable to it; is that right?-- That's right.

So what, in effect, that paragraph means, if I have summed it up correctly, is that if they were the appropriate figures it would mean that 68.3 per cent - or on 68.3 per cent of occasions you would expect the reading to be within the relative standard deviation area of 10 per cent plus or minus?-- Yes.

Can I ask you secondly whether the second page of the photocopy there represents that page?-- Yep, that's it.

Can I ask you then to go to page 83 of the book? Page 83 refers to a Drager tube 6733051 which has a standard measuring range of 2 to 60 ppm?-- Yes.

Is that one that -----?-- That's the one, yes.

That is referred to as the low range tube?-- Yes.

In your experience?-- Yes.

In that case, just taking up the relevant aspects, as I say, the standard measuring range is 2 to 60 ppm and the standard deviation is plus or minus 10 to 15 per cent; is that so? Now, before I ask you anything more about that can I ask you to go over the page to page 84 which refers to a Drager tube CH 25601?-- Yes.

And that seems to come in two measuring ranges, one being from 100 to 700 ppm and the other being 5 to 150 ppm?-- Yes.

Now, was either one of those a tube that was used in your experience?-- Yeah, I think that was the 5C tube, 0 to 700 parts.

100 to 700?-- Well, there is two scales on it, basically 0 to 700.

There are two scales on the same tube?-- Yes.

One is on the back of the other?-- Yes, and given the extra

pumps to get more a accurate reading.

So if you wanted to measure in the high range you would give two pumps, according to what appears on the next line, and in the low range 10 pumps?-- Well, if you give it two pumps you would see the stain appearing between 0 and 100, so for more accuracy you would give it the extra pumps and then you would read the other scale.

Read the other scale?-- Yes.

Were they what were referred to as the high range tubes?-- Yes.

In respect of that they have got a standard deviation of plus or minus 10 to 15 per cent; is that right?-- Yes.

You did say yesterday, if I remember correctly, that the low range tubes were no easier to read on this occasion on 22 July, the low range tubes that you got were no easier to read than the high range tubes?-- No, both the same colour change and the same diffusion.

So in effect, reading the low scale on the high range tubes, you were able to do that just as easily as with the -----?-- Yeah, in that range, yeah.

The low range tubes, if you look back at page 83, certainly provide a wider or longer length of tube over which that scale of 0 to 10 -----?-- Yeah, it allows more accurate estimation.

So you might with the low range tubes, if there was any doubt about it, you might be able to read that - any reading between 0 and 10, for instance, you might be able to read more accurately -----?-- Yes, that's the idea of it.

That's illustrated to some extent by what is shown in the material on those two pages, 83 and 84?-- Yes.

Again those pages are there in the bundle of photocopies; is that so?-- Yes.

Your Worship, I won't tender the book, although it can be kept here if anybody wants to inspect it, but I will tender the photocopy pages.

WARDEN: Admitted and marked Exhibit 153.

ADMITTED AND MARKED "EXHIBIT 153"

MR CLAIR: Mr Kerr, you are aware of the practice, from what you said in evidence yesterday, of at least at one point the weekly readings being taken for the purpose of calculating the CO make?-- Yes.

And as far as you were aware they were then to become either shift by shift or daily readings after the 22nd?-- Yes.

And those readings were to be done by deputies, you would imagine, using a Drager tube; is that right?-- I don't know who was supposed to take the readings.

Well at least the readings would be done using a Drager tube; is that right?-- Yes.

What did you understand was the purpose of those readings being taken using a Drager and then combining the reading from the Drager tube together with the wind velocity to achieve a calculation of CO make?-- Well, that's the normal way to do it, isn't it?

Pardon?-- That's the normal way to do it.

The normal way to do it?-- Yes.

Well, did you, for instance - or can you now see any particular benefit in it being done by way of a reading on the Drager tube and a calculation of CO make using the wind velocity present when that reading was taken as opposed to simply taking some kind of average from the Unor system and blending that with some reading of wind velocity?-- I guess there would be no advantage of it. It all depends what you want to base your benchmark on, the Unor or the spot readings taken underground. As long as they didn't deviate too much, as I talked about with Mr Morrison, you would pick up a trend no matter - whether you used the Unor or the Drager.

Now, with the Unor system of course there is a substantial delay, as I think you yourself mentioned, between when the sample is taken and when the sample is analysed and the reading printed out?-- Yes.

If you wanted to calculate CO make, on what basis would you assess the relevant wind velocity if you were basing it on a Unor system reading?-- Unor system doesn't read wind velocity.

I appreciate that, that's why I'm asking you, if you wanted to calculate your CO make how would you determine what wind velocity to use in conjunction with the Unor reading?-- You'd have to read the reading taken on the anemometer.

How would you take a reading on the anemometer at the appropriate time, that is at the time that the Unor sample is being taken into the system?-- It would take a bit of co-ordination, wouldn't it?

It would, wouldn't it?-- Yes.

The fact is if you want to get an accurate calculation of CO make, the way you do it is to take your wind velocity reading at the same time as you take your reading of CO in parts per million?-- Yes.

And really the only practical way to do that is to do it using a Drager tube?-- Yes.

You are not going to race down there with an anemometer and take your wind reading at the same time as the Unor point just happens to be sampling at that monitor point and then go up top and wait for the 50 minutes or 65 minutes to see what reading comes out of the Unor tube and the Unor analysis and then calculate your CO make, are you?-- No, it would be unlikely that you would do that.

It's totally impractical to do that really, isn't it?-- Yes.

so there is a very good purpose in using your Drager tube, taking your wind velocity and calculating your CO make in that way, isn't there?-- Yes.

So that if you were a careful and conscientious supervisor then you would have some careful regard to the figures that are produced in calculating CO make in the way that I've just mentioned, wouldn't you?-- Yes.

You wouldn't, for instance, ignore what might be a series of apparently high CO make calculations because for one reason or another the readings that were used to calculate that CO make are not in tune with what's on your Unor system?-- No, it would be unwise to ignore them.

And if in fact you did have a series of relatively high readings, for instance the ones that I indicated to you yesterday and then about which you've been questioned by Mr Morrison, it would put you on your guard at least, wouldn't it, as to what's happening in the panel. I mean those figures that were drawn to your attention this morning and yesterday of 18.35 on 28 July, 18.93 on 1 August and then on 6 August 18.93 or 94 through to 21.04. They are all very alarming readings in terms of CO make?-- If you are aware of that 20 parameter they would be alarming, yes.

Yes, that's right, but, of course, if you didn't take the trouble to calculate them and you were unaware of those readings then you wouldn't be in a position of having the red flag raised or the alarm bells ringing in your mind about the possibility of a heating in the panel?-- Obviously if you weren't aware of the information you couldn't be alarmed.

But if on the other hand somebody reported to you that there was a smell, a benzene smell, whether or not there were machines in the area at the time, and somebody else might have reported to you that there was a haze evident in the top return, and then if as undermanager, for instance, at the mine you might have observed that haze yourself, then rather than simply look at the figures on the Unor system, if you had figures available to calculate your CO make in the only way that it can sensibly be calculated, that is using the Drager tube readings, you would calculate that, wouldn't you?-- Yes.

And if you calculated those figures that were available and you came up with 18.35, 18.93 and a range up to above 21 then

you would look at all those features together, wouldn't you?-- Yes.

The fact that somebody at least has reported a haze, the fact that somebody at least - or a couple of people have reported a smell, slight tarry smell, strong tar smell, slight benzene smell and you would look at these high CO make calculations that you were getting and you would go to the panel and you would make whatever investigations you could to see whether there was a heating there?-- Yes, if you were aware of the parameters.

And there is a way in which you can ascertain whether there is a heating, isn't there, using a Probeye, infrared -----?-- If you could get a direct line of sight with the instrument on to the hot spot, yeah, you could. Otherwise you wouldn't be able to, no.

Worth a try if you had all these other indicators?-- It would have been part of the investigation, yes.

Prior to sealing, of course, the whole of 512 was at least accessible down the top return and in through whatever doorways existed in the cross-cuts; is that right?-- I'm not aware of that.

You didn't go right down there?-- No.

You went down to some extent -----?-- Just down the return though not into any extracted area.

No, but as far as you knew you could certainly go down the whole of the top return?-- Yes.

And possibly even across 13 cross-cut?-- I didn't have a look in there. I wouldn't know what the conditions were.

You wouldn't know about that. Okay. You were asked quite a number of questions about the basis on which you formed your conclusion after your visit on 22 July down the 512 Panel and in particular you in that context agreed that the best way to find out what was happening in any panel was to go and have a look for yourself; do you remember that?-- Yes.

But if you were really being asked for a useful opinion, would you expect that you might be informed about other recent events in the panel, detection of smell or that sort of thing?-- Yeah, any informed opinion requires all the background knowledge.

To some extend is that because if you do have a heating in a panel it's quite feasible that on one occasion somebody might observe a haze but then on another occasion the haze just might not be visible because of changed circumstances in the panel, some change in ventilation, for instance?-- I think for a haze that disappeared there would have to be some sort of major disruption to the ventilation, yes, because the experience with the haze I had was it was only down the return roadway from the goaf area.

That's in 5 North you are talking about?-- Yes.

And that was when the heating was well advanced?-- Yes.

But if it's only a heating at the beginning of its time, that is before it gets to the stage that it was certainly at during that day when 5 North was sealed, then if there was any haze produced it might not be present to be seen on all occasions that somebody goes down; is that right?-- I couldn't offer an opinion on that. I wouldn't know if it changed or remained constant.

In relation to a smell, would it be the case that that might be present, particularly when a heating is in earlier stages, but nevertheless a heating rather than just some suspicions that there might be a heating, when a heating is in its early stages there would be no reason why a smell might be detectable on some occasions but not detectable on others?-- Again I don't know.

Well, from your experience can you venture any opinion on it at all?-- No, I wouldn't be able to say what causes - or what might cause a smell to be there one day and not the next.

Is it safe to say that from the point of view of an experienced miner, and particularly in the safety area, that if an experienced miner reported a smell or for that matter a haze, you wouldn't dismiss that report out of hand?-- Certainly not.

And in fact depending on the experience of the miner or your

respect for his ability or otherwise, you wouldn't in any sense readily dismiss it; you would consider it worthy of close investigation, wouldn't you?-- I think that would be good practice, yes.

Now, you were asked about the fact that in the Strang and Mackenzie-Wood publication that this matter of CO make doesn't get a very prominent place, and you agreed that that was the case?-- In terms of volume of words, yes.

Is it the case that that publication was 1985?-- I'm not sure of the date.

Just have a bit of a look at it, if you would. It will be there just after the title page ordinarily, on the back of the title page?-- Yes, it was endorsed by Mr Roxborough in 1985.

And wasn't it the case that you told us yesterday that really this whole business of CO make didn't find its way into its current state of importance until about 1987/1988, I think you said yesterday?-- Yes, in Queensland that was the case, I believe.

Thank you, Your Worship.

WARDEN: Thank you, Mr Parkin.

EXAMINATION:

MR PARKIN: Mr Kerr, just a few questions for clarification. Could the witness be given this graph? I think it's Exhibit 25. Mr Kerr, you were asked a question previously - have you ever seen this graph before?-- As I said, I may have. It may have been the one or it may not have been the one on that day.

Well, can you just look at the graph now, and I think you will see that on 15/7 the CO make at that time - and this is before the information that was just passed to us by Mr Morrison and that started on 23/7, so I presume this is correct, this information - you will see that the reading is 14.59 lpm?-- Yes.

And you will also see that if you go back to 16/6, that's a fairly steep increase, would you not agree?-- Where it goes from about 7 up to 14?

Yes?-- Yes.

So, that would be a fairly steep increase, wouldn't you agree?-- Yeah, the trend is fairly steep, yes.

Now, on the day of your visit on the 22nd, we have established there was some difference between readings that were taken

between 18.98 and 13.7, and let's assume that we will take the reading of 13.7. So, if we, on 22/7, plot the reading of 13.7, you see that there is obviously a fair - a dip there?-- Yeah.

That could be due to a number of things, ventilation changes amongst them. So, if we stay at that, did that cause you any concern at all?-- I was looking at the average, the average trend, and it was going up.

The reason I ask the question is because obviously you were concerned enough to go down the mine and investigate the thing?-- Investigate that high reading.

That high reading?-- Yes.

And you also mentioned that to Paul Mackenzie-Wood and indeed the Chief Inspector of mines?-- Yes.

So, you were obviously concerned about it?-- It was a situation that required investigation, yes.

I think you mentioned to George Mason, or you said that, or in conversation, that frequent monitoring would be taking place from that point on. I know it's been spoken of before, but can you just reiterate what that monitoring was supposed to be? Was it shiftly, daily, weekly?-- I cannot recall whether it was going to be shift or daily but -----

But - beg your pardon, I'm sorry to interrupt?-- We discussed it, as far as I can remember, before we went down the pit and then I spoke to George after I come out of the pit, but I can't recall whether he said or we discussed beforehand would it be done on a shift basis or a daily basis.

If you were doing it, what would you do?-- The thing would be to do it on a shift basis.

And then plot the graph?-- And plot the graph.

On a shiftly basis?-- To get a trend, yes.

So, at no time were you made aware of this graph which shows an increase from, reading here, just over 7 to just over 14 and a half in, say, a reasonably short - well, it's just under a month, I guess?-- Yes. As I recall, there was no specific discussions on any graph except perhaps the 5 North-west one, that I can remember anyhow.

Did - I think it's very important this question - did anyone at any time - and it's reiterated several times - but did anybody at any time mention a smell to you at all?-- No.

Because Reece Robertson did report a benzene-type smell as early as June?-- Yes, I'm aware of that now.

But not at the time?-- No.

Had you been aware of that, would that have made a significant

difference to you?-- I believe so, yes. That's another indicator, yes.

So, I guess also in your discussions with - your brief discussions with Brian Lyne and Paul Mackenzie-Wood, you certainly didn't talk about the litres per minute at the time of your visit?-- No.

And I think you have answered the question that after you left the mine on 22/7 you didn't follow up with George or anyone else about the 512 Panel?-- No. From my perspective from that Friday night there was only two things that could have happened - well, that's what I thought anyhow - assuming that the place was going to be monitored. Firstly, nothing would have happened in that the - that thing behaved itself and allowed extraction to be completed. The second thing that could have happened, from my perspective, is that it didn't and that I would have been notified that the panel was heating and whatever action was going to be taken.

So, I guess in your discussions you - it was such that you didn't ask George about the previous - you know, the readings or to look at the graph?-- No.

Just a reference to the barometric pressure you were asked to look at by Mr Morrison. Is that slight variation shown on the graph likely to have any real significance on the CO readings, in your opinion?-- I don't believe so, no.

I agree. Now, the information that's been passed to us by Mr Morrison, but more a chance to really examine this in greater detail, but one observation is the latter readings - the Maihak readings look higher than the Drager readings anyway. Let's assume at this time that Cole Klease's reading on 6 August - let's assume it's 18 lpm. I've made a calculation here, and I could be out one way or the other, but let's assume it's about 18 lpm. So, if you had been aware of the fact that a haze or a smell had been detected and that the litres per minute of CO in 512 Panel had risen from 14.7 lpm on 22 July to 18 lpm on 6 August, what conclusion would you have come to?-- Even without the other indicators, I believe the CO make would be enough to cause great concern.

Great concern such that there may be a heating?-- Quite certainly there would be a heating.

Thank you very much, I have nothing further.

EXAMINATION:

MR NEILSON: Mr Kerr, you have indicated that both Len Graham and John Blyton have participated in Mines Rescue competitions and I think have been members; is that right?-- Yes.

Have been members of the Mines Rescue Brigade for quite some

time?-- Yeah, Mr Blyton is approaching 20 years, I think, and Mr Graham probably in excess of 10, yes.

Well, Mr Graham gave evidence to the Inquiry yesterday, so what he said is more fresh in my mind, so I would like to concentrate on Mr Graham if we possibly could. In your opinion, how would you rate Mr Graham in terms of his experience and knowledge associated with the types of things - spontaneous combustion, his ability as a rescue brigade member, etc?-- My opinion of Mr Graham as a result of experience throughout the years, I would regard him as a very competent operator.

Very competent?-- Yes.

Yes, he certainly received a lot of accolades from people -----?-- His track record is good.

----- during the course of this particular Inquiry. Can I ask you then: what would you believe his knowledge would be in terms of spontaneous combustion?-- What he's been - what he's received in the training at Mines Rescue, plus the extra given in all the competitions that he may have participated in. I believe he should have had a sound knowledge of development, detection and control of spon com.

Can you give me some sort of an indication as to the detail of the training he would have got in relation to this from yourself or through the course of Mines Rescue competitions?-- We go into detail equivalent to what's contained in the literature, plus the value of any experience gained.

So, would it be fair to say that Mr Graham should have a fairly extensive knowledge of the causes of spontaneous combustion?-- Yes.

Where you would be more likely to find an example of spontaneous combustion?-- Yes.

How to translate any particular findings such as being able to take a reading in parts per million and calculate that into litres per minute?-- Yes, he would be able to do that.

And then how to be able to determine from such a reading just what the circumstances are?-- Yes, I believe so.

Well, I'm not asking you to tell me you believe so. Would you expect him to have that knowledge from the training that he has been given?-- Certainly.

Okay. Well, would it surprise you if I were to tell you that the evidence he has given to this Inquiry goes to the extent of - without quoting his exact words - we can go to that if I am called upon to do so because it's in transcript and it's available - he has indicated to this Inquiry that he is able to do the calculations because he was taught that in Mines Rescue, but once he has calculated litres per minute of carbon monoxide make, he really doesn't know what it means?-- That would surprise me.

Well, it surprised me too; it surprised me too. Does it also surprise you if I were to tell you that during the course of evidence quite a number of deputies that have been before this Inquiry, a number of very experienced deputies that have been before this Inquiry, they have received no training whatsoever in relation to spontaneous combustion?-- That's an industry fact.

I beg your pardon?-- That's a fact of life in the industry, isn't it?

I am asking you: does that surprise you?-- No, I'm not surprised because I know it happens.

You know that that happens?-- Yeah.

Do you think that's acceptable?-- No.

Can I ask you, Mr Kerr, how many times you have actually personally experienced or had any experience with spontaneous combustion?-- On two, three occasions at Laleham Colliery, South Blackwater, and the one in 5 North-west.

So, you certainly have had some personal experience with spontaneous combustion?-- Yes.

You were asked a question by Mr Morrison, or it was put to you that in the absence of certain factors that we are all now aware of - and you are certainly aware of them - things such as the detection of a smell, the visibility of a haze and some of the higher carbon monoxide make readings that we are all now aware of - that the conclusion that you reached in the absence of the real facts, that is, being that the new method of extraction could have contributed to the -----?-- To the extra make.

To the extra make?-- Yes.

But that was a fair conclusion to make?-- In the absence of all other things, yes.

I don't disagree with that?-- Right.

It's a little bit of a Mickey Mouse type question because, you know, we are all now aware of certain other facts, so the relevance of what you thought at that particular time and what you may think now - I mean, they are poles apart really, aren't they?-- Yes.

Simply because you are now aware of things that you weren't made aware of -----?-- Yes.

----- at the time. You are aware of the position of Union Inspectors?-- Yes.

Local Union Inspectors?-- Yes.

Do you know any of those persons?-- Yes.

Are you aware that the Union conducts what we call Check Inspectors' Conferences?-- I have heard of them, yes.

You have never attended one?-- No.

I thought you had, that's all?-- No.

So, when you indicated to Mr Morrison that the Union doesn't train people or have a training program, that's not quite right, is it?-- I was unaware of any particular training program that the Union provided for its members, yes.

But you are aware that we do conduct - or the union does conduct training programs for local check inspectors for all of our mines?-- No, I only knew it as a conference, not as a training tool. I was unaware of that, yes.

It is just that I was going to question where our money goes if it is not a fact. I may have had to put some other people in the box. Do you think that it would be reasonable to expect that the union should provide training for deputies?-- Training is an industry problem, or an industry concern.

I am particularly talking about deputies when I ask this question?-- Ongoing training, whether it is provided by the union or whoever, it has got to be beneficial.

But wouldn't it be more appropriate in the case of deputies - given their statutory responsibilities at the mine that they work at - would it not be more appropriate for the employer to ensure that the deputies were properly trained?-- Yes, I guess it would be an employer responsibility.

You have been asked a lot of questions about the legitimacy of a number of the factors that have been put before you. I mean, there has been questions about the legitimacy of the sighting of a haze, the detection of a smell, and some of the carbon monoxide make readings have been put forward in certain documents?-- Mmm.

Is it not a fact that whether it be at Moura mine or at any other mine that it would be reasonable to expect differences between Drager tube readings and instruments such as the Maihak Unor?-- Yes.

I mean, it would be very uncommon to have exact readings all the time?-- I would say so.

And if we are going to question legitimacy of a high reading, then we would also have to question the legitimacy of a low reading?-- Yes.

So, it's a consistent problem that we have?-- Yes.

So, it is not necessarily the case that you would just look at a high reading and say, "That's incorrect." - you know, "That's not consistent with some other piece of information."?-- Provided you check that out.

Yes. And if you checked it out and you found that there were inconsistencies in the lower range as well, then it would be pretty fair to assume that where there are inconsistencies, then you must make your judgment as to which-----?-- What is inconsistent.

Yes, that's right, what is inconsistent?-- Yes.

Given that livelihood depends quite often upon the outcome of such readings, and you have a situation where there is an inconsistency where one reading may be higher than the other, bearing in mind livelihood may depend upon the judgment you

make, which one do you go for?-- You always err to the side of safety.

Which would be?-- The high one.

The higher reading?-- In that particular case, yes.

I mean, it would be very irresponsible to base your judgments upon the lower reading simply because it might look a little bit better?-- If that was the only reason why you use the lower reading, just to make it look better, yes, certainly would be.

The reason you might want to make it look better could be very expansive, and I'm not going to go into the reasons, but-----?-- No.

But it would be the most responsible thing to do to take the higher reading, and if there is an error, then you have erred on the right side?-- Yes.

So, on the question of the legitimacy or the illegitimacy of the things that have been put to you which, I guess, you have agreed to some extent that yes, there may be some question over legitimacy, it is hardly relevant for us to be sitting here today worrying whether a particular reading or a particular smell may have been detected or whether or not a haze was caused from a heating or from a piece of diesel equipment, when the very reason that we are here sort of legitimises all of those things in one, doesn't it?-- Yes.

Thank you. No further questions.

EXAMINATION:

WARDEN: Thank you, witness. Does the Mines Rescue Brigade put out an annual report?-- No, I don't think so.

There is no document-----?-- No, not an official document.

That you know of?-- No.

Is everything just buried in departmental documents?-- What sort of subjects would you be talking about?

Budget, staffing, courses?-- Yeah, there would be records-----

There would be some records somewhere?-- Yes.

Library. I take it that what you produced yesterday is not the sum total of your library?-- Oh, no, we have other-----

You have other publications on other things?-- Yes.

Is that distributed from the central source?-- No.

Is it left to each individual brigade to ferret out their own publications?-- Yes.

And then you, as a training officer, make such material available that you can?-- Yes.

So, a lot of it is up to your discretion, your experience?-- Yes.

EXAMINATION:

PROF ROXBOROUGH: Mr Kerr, could you tell me how many mines does the Moura Rescue Station service?-- Only the - what were the underground mines at Moura.

How many rescue stations are there in Queensland altogether?-- Five.

And how many mines do they service?-- I think there are 14 underground mines at present.

So, you would be better off - or Moura No 2 would be better off than average in terms of the servicing it gets from its rescue station; is that correct?-- No, it would be no different.

No different?-- No.

How many full-time rescue people are there employed at the station?-- In Moura?

Yes?-- One.

One?-- Yes, myself.

Yourself?-- Yes.

You are responsible for all of the training?-- Yes.

You don't bring people in?-- Yes, particularly for induction courses or any other reason. Yeah, we'll use staff from other stations.

Do you ever use the staff from the mine - the mine management in any of your training programs?-- No, I don't think so.

Is there any reason why they shouldn't be involved?-- No, if they can be of some use.

How much of your time would you spend on training?-- Well, I guess training is the major part of our function.

Is it?-- Yes.

I see. You said, I think yesterday, to - I can't recall whether it was Mr Clair or Mr Martin - that you were no longer responsible for training deputies on behalf of TAFE; is that correct?-- That's right, yes.

So, things have changed somewhat?-- Yeah, the system has changed.

In what way has it changed? Has the course-----?-- No, they have developed what is called a new Mineral Industry Studies Centre in Rockhampton, and it is all conducted from there. I believe also there is a campus, if you like, at Emerald.

Have the subjects taught and the examinations changed? They are still run, presumably, by the Mines Department, are they?-- By TAFE - by this Mineral Industry Studies Centre.

But surely the Mines Department issue the certificates?-- Yes, ultimately the Board of Examiners.

Do they not conduct the examinations? Do they not set the papers and mark them?-- No. As far as I know, the examinations are set by the TAFE.

I think you said yesterday that - unless it has changed now - that the examination consists of one paper?-- I think in the past there may have been two papers, but generally it is one written paper, either a multi-choice format or, say, six or seven written answers, or something like that.

And that assessment - that is to assess a candidate's knowledge over a broad range of subjects?-- Yes.

A quite wide range of subjects?-- Yes.

Could you outline the nature of those subjects?-- It ranges from mathematics, to mining practice, geology, mine gases - you know, a whole range.

Strata control?-- Yes.

Ventilation?-- Yes.

Use of explosives?-- Yes.

There are quite a lot of subjects?-- Yes.

So, it is quite conceivable for people to receive the statutory certificate without necessarily having been tested on issues like spontaneous combustion?-- The written examination is only one part. The next step is an oral examination before a department inspector and I think some experienced person from the industry. It may be that they would have knowledge of what was on the examination paper and then supplement their questions to that, but it may be the case that someone did get through without having to answer a question on spon com. I don't know. I don't know if the department inspectors specifically ask spon com, or it may not

be specifically set out in the written paper.

But it is quite conceivable that deputies will have received the certificates without having been tested on their knowledge of spontaneous combustion, as it might be true - there may be other aspects they haven't been tested on, given the relatively low number of examination questions that they can be asked, either in written papers or in oral examination?-- That is possible, and that could happen, yes.

How do you keep yourself up to date with your knowledge, Mr Kerr?-- Only from publications, or if there is an industry seminar on certain subjects, yes.

Does the rescue station or you yourself subscribe to any professional journals?-- Yes, a couple of the magazines, yes.

What would they be, can you remember?-- I just forget their titles.

Are you aware of any journals that deal specifically with coal mining matters?-- No.

Are you a member of any professional association? Australasian Institute of Mining and Metallurgy?-- No.

Is there a Coal Mining Managers' Association in Queensland?-- Yes.

Are you a member of that?-- No.

They have meetings, do they, the Mine Managers' Association?-- I believe so, yes.

You don't attend those meetings?-- No.

Is there an Association of Rescue Station Superintendents in Queensland?-- No.

There is no opportunity for you to get together?-- We do, yeah.

On an informal basis?-- No, for a formal meeting.

How is that organised? Is it on an ad hoc basis?-- Usually twice a year, perhaps.

I see. But you are not formalised in any way to meet on a regular basis to exchange views and so on?-- No, but it does happen.

It does happen. Is there a national association?-- Not that I'm aware of.

So, do you get an opportunity to talk to your colleagues in other states?-- Yes.

Again on a fairly regular basis?-- Once a year.

I was interested in the matter that was touched upon yesterday and again today by Mr Clair, and this is to do with the accuracy of the Drager tube and the Exhibit 153 where we were referring to the instrument having a standard deviation of 10 to 15 per cent. Now, this refers to the intrinsic accuracy of the instrument and has nothing to do with the accuracy of people reading it, correct?-- I'm not sure if that includes the subjective issues, or the intrinsic accuracy of the instrument.

Yes, I would guess that it is the intrinsic accuracy of the instrument, because if we are talking about those levels of standard deviation, then they can make quite significant differences between what you think you are reading and what is actually being measured?-- Yes.

On a simple calculation and using that standard deviation of 15 per cent, if my understanding of what standard deviation means is correct, it means if you are reading 8 ppm as a 1 in 40 chance, the true reading could be 10.4-----?-- Yes.

-----parts per million. It is a matter of concern, isn't it?-- Yes.

Thank you.

EXAMINATION:

MR ELLICOTT: I initially have some questions regarding the Multiwarn gas detection instrument. The term "multi" implies to me that it measures not just one thing. Can you tell me what it does measure?-- It measures simultaneously carbon monoxide, methane and oxygen.

I think you also indicated that that instrument may give fluctuating readings when used underground?-- Yes.

Might not that be a measure of fluctuating gas concentration?-- It may be, yes.

How long does it take to calibrate the thing before use with a span gas?-- To allow a proper calibration you have got to do the three, and it takes about 30 minutes for a warm-up time on, I think, the oxygen cell.

What if you were just using the CO cell - or just using the CO cell-----?-- The correct procedure is to do the three of them in a sequence.

I won't ask you to support short cuts, certainly. I think you indicated in earlier evidence that the warm-up time for the CO cell was approximately 10 minutes?-- Yeah, I think that's the figure.

Presumably the thing could be turned on on the surface and

warm up in the transport on the way underground?-- Yes.

So, given that the calibration procedure may be a little time-consuming, is it not still desirable to take such an instrument underground to do a form of survey where that's the purpose of your visit?-- For routine use, yes, that would be all right. It is certainly a good instrument, yes.

You would support its use in routine use. What about in special purpose use as a problem-solving tool?-- Yes.

It would be a good instrument for that?-- Yes.

So, might not it have been reasonable to take it on the 22nd of July?-- As I said before, I believe it was good practice for an initial verification to use the same instrument as the reading was taken with.

Can't two of the same thing be equally wrong?-- Yes.

With regard to the Drager tube, it is, as you know, a means of sampling an atmosphere by pumping that atmosphere through a tube, and in doing so taking a number of pumps. Would you agree with me that that process is really an averaging process?-- Yes, over a period of 10 pumps, that's an average, yes.

And a period of 10 pumps might take about three minutes, typically?-- Yes.

Would you agree that that averaging process may remove any little peaks or fluctuations that occur during that process?-- Yeah, over a three minute period, it could.

With regard to the Maihak monitoring system at the mine, would you agree that that is of a type known as a tube bundle system?-- Yes.

A sample is drawn through that system - through some kilometres of sample tube; is that the case?-- Yes.

Would you agree with me that pulling that sample through a sample tube is in many respects no different to pulling air down a mine roadway?-- Yes.

Would you agree that during its travel along those some kilometres of sample tube, you may have some mixing occur?-- It's possible for leakage to occur, yes.

I am not thinking about external atmosphere through leakage, I am thinking of mixing with the sample gas itself?-- Yes, over that distance.

Would you agree, then, that that, again, produces an averaging process?-- Yes, over that time period.

A process in which plugs or peaks may, in effect, be flattened as they traverse the tube?-- Yes.

Would you agree with me that that may be a mechanism whereby an apparent gas concentration may be lowered in its transit through the tube?-- Yes.

So that if one had a reading at the entry to the tube the final reading at the analyser end may be lower?-- Yes, over that distance.

Are you aware that the Maihak system doesn't continuously sample gas sampling streams?-- Yes, it's cyclic.

Are you aware that in calibrating the system and checking for leaks a not inconsiderable volume of gas has to be put into the system in order to overcome that intermittent sampling?-- I'm not aware of that - sampling testing procedures.

Would you agree that there is the potential in that intermittent sampling regime to miss a fluctuation in gas concentration or a plug?-- Yes.

Would you agree that some measure could be got of the likelihood of both the Maihak system missing a plug and of a Drager sample missing a plug by taking into account the sampling time of the Drager system and the sampling regime of the Maihak system and working out some form of probability?-- Probably extensive testing could give you some factor to -----

Would you accept that the mathematics are available to do that?-- Yes.

Would you agree that a bag sample or a bladder sample or a GFG tube sample may provide a ready means of resolving apparent conflict between Drager tubes and the Maihak system?-- It's a means of comparison, yes.

But I think from earlier evidence to this Inquiry the taking of a bag sample is a very complicated and difficult and awkward thing; is that the case?-- No, taking of a bag sample is a simple matter.

Could the witness be shown Exhibit 29, please? That is the material presented at the SIMTARS seminar which I believe was in 1988; is that correct?-- Yeah.

That is the volume which covers the subject of spontaneous combustion; is that correct?-- Yes.

Could I ask you to turn to section two which I believe is the spon com section?-- Yep.

And then to page 9/2. Is that a page titled "Carbon monoxide make"?-- Yes.

Can I ask you to go to what is the second paragraph of text which starts, "Experience in Australia..."?-- Yes.

Could you read that for me, please?-- "Experience in Australia indicates that carbon monoxide makes of more than 10 lpm require investigation and more than 20 lpm indicates a

heating is well developed and that urgent action must be taken."

And there is a reference given to that statement, it's down the bottom of the page; what is that?-- Mackenzie-Wood P, "Fire gases and their interpretation", Mine Gas Seminar, Rockhampton 1988.

Can you tell me if that is the basis for your observation in earlier evidence that the proceedings of that symposium supported the applicability of those figures to Queensland coal?-- Yeah, I think that's where I said it was written, in here.

It came from there, and you would think that would be the statement that led you to form that opinion?-- Yes.

Are you aware of the nature of that experience in Australia on which that statement is based?-- No.

Presumably if one went to the reference one would find it out?-- Presumably, yes.

And if it wasn't there then perhaps Mr Mackenzie-Wood himself could be of some assistance?-- Yes.

I think you also indicated in earlier evidence that those figures came from work originally done in Germany?-- Yes, or somewhere overseas.

You would agree that German coal mining proceeds exclusively via longwalls?-- Yes.

Predominantly, if not exclusively, advancing longwalls?-- Yes.

Would you agree the Germans have no bord and pillar mines?-- Yes.

Would you agree that a longwall mining layout is a far more regular thing than a bord and pillar layout?-- A regular thing?

A far more regular thing in terms of its geometry and the consistency of its ventilation?-- Yes.

Would you agree that the knowledge of goaf behaviour is probably a lot better because of that?-- Yes.

Would you then agree that there is far more potential in bord and pillar mining for there to be a lot of confounding factors on things such as CO make?-- Yes.

Especially when there are lots of ventilation changes?-- Yes.

And I would suspect in some bord and pillar operations nobody really knows where the air is going?-- That would be a fair statement.

Can the witness have Exhibit 21, please? Can you turn to the second last page of that exhibit, please? Do you recognise that to be the graph discussed earlier of CO make in, I think it was described as 5 North?-- Yes.

Can I ask you to turn to the page before that? Can you read the title there, please?-- "5 North - CO make litres per minute evaluation."

Can you read for me the second paragraph, please?-- "Therefore the VS 14 graph only illustrates the trend of carbon monoxide make in that return (5 North East return.) It in no way reflects total carbon monoxide make of the section as the 5 North section was ventilated by two returns."

Would you agree that one's use of that graph must be tempered by that statement if that statement in fact applies to that graph?-- Yes, but having knowledge of that situation, there was no CO in the bottom return.

Thank you. That's a great clarification. Nothing further, thank you.

WARDEN: Thank you.

CROSS-EXAMINATION:

MR MORRISON: Can the witness have Exhibits 110 and 25, please? Mr Kerr, Exhibit 25 is the graph that Mr Parkin asked you to have a look at -----?-- Yes.

----- when he was asking you what you saw on 22 July. There is no way you could have seen that graph because that graph wasn't produced until about 5 August?-- I see.

There is not a chance in any way that that could have been seen by you. Put that one aside. Exhibit 110 was the document I asked you to look at earlier in the day which is a number of graphs of various panels. Before we go back to it, can you recall that I asked you about the fact that you had said in evidence you had seen various graphs of various panels from which you were able to make a comparison of 512's make to the make of other panels?-- Yes.

It follows from that, and I think you agreed with me earlier, that you obviously saw a graph of make for 512?-- Yes.

And then if you have a look at 110, I took you to the third page from the front which is a graph for the CO make 512 as it stood at 15 July, that's a week before you were there, and we discussed, and I think you agreed, that it was possible it's that graph you saw?-- Possibly, yes.

Thank you. I have nothing further on that point. Can I ask you two other things - one other thing? Firstly is it the case that the Multiwarn has a battery?-- Yes.

And when you go to use it the battery goes with it?-- Yeah, it's part of the instrument.

So each Multiwarn has to have its own battery?-- Yes.

You can't sort of have one charging up and switching batteries around the place; each has to have its own battery?-- Yes, but you could have spare batteries.

You would have to buy a number of spare batteries in order to have immediate changeover?-- Yes.

And avoid all that charging up time?-- Yes.

And ideally, for however many Multiwarns you have you would have to have either double or treble that number of batteries?-- I don't know about double or treble, but depending on your rate of use you would have to have spare batteries so you could get an immediate use.

I have nothing further Your Worship.

WARDEN: Can we adjourn for lunch and resume at 2.15? Witness, you may stand down. You are excused.

WITNESS EXCUSED

THE COURT ADJOURNED AT 1.10 P.M. UNTIL 2.15 P.M.

THE COURT RESUMED AT 2.19 P.M.

MR CLAIR: May it please Your Worship, I call Dennis John Evans.

DENNIS JOHN EVANS, SWORN AND EXAMINED:

MR CLAIR: Your full name is Dennis John Evans; is that correct?-- That's correct.

Mr Evans, you are a mine electrician at Moura No 2 Mine; is that so?-- That is right.

You started in the coal mining industry in February 1973 at the Leichhardt Colliery as an acting mine electrician?-- That's correct.

And day shift leading hand?-- That's also correct.

You started at Moura on 23 April 1975 as a staff mine electrician at No 2 underground?-- That's right.

Now, you've set out in your statement that was made on 29 August 1994 a number of matters that are relevant to the issues before this inquiry; is that so?-- That is right.

I am just going to touch on some of those, I'm not going to go exhaustively through your statement. You mention on page 2 of your statement something that you describe as a BM1 gas alarm?-- That's correct.

Can you explain what that is?-- It's a methane sensing device with a scale of 0 to 5. We were using it in the return to monitor stray gas levels that may come from a fault on any of the ranges in the 5 South/510 area of the mine. It was -----

When you say in the return, it was somewhere outbye of both 5 South and 510, was it?-- It was at 5 cut-through 5 South in the return.

At the time of the explosion on 7 August of last year that BM1 gas alarm did go off; is that right?-- Michael Squires told me that it had, yes.

Now, in all the circumstances was there any way of determining whether that was caused by high gas levels that would ordinarily trip the alarm or whether it might have been caused by some damage to the BM1 unit as a result of the explosion?-- There'd be no way you could do that unless you physically examined the thing.

What sort of damage can these BM1 units sustain?-- There is a possibility of tearing the sensing head off the end of the

cable or - hang on, tearing the sensing head off the end of the cable that goes from the sensing head back to the control unit, or actually rupturing the cable itself due to debris or something like that.

Either one of those things could have the effect of stripping the alarm?-- Exactly.

Now, in the electrical shift report for 6 August there was a notation that there were some problems with the continuous miner in 512 Panel. Can you enlarge a bit on that?-- Yeah, well, we had the cutter head motor on - I'm not too sure which side, the cutter head motor had burnt out and needed to be replaced and on the day shift on Sunday, 7/8, they had backed the unit to a cross-cut with the heads projecting into the man and supply road and this was to allow us access to the machine - actually to the motor itself. The old motor had been taken out after disconnection on the Sunday day shift and the new motor had been put in, but at that time no connection - I think it had been connected. I really cannot accurately tell you that, but we had no machine cable to that miner at all. It was being used for another purpose. I think it was to flit the feeder.

You say that you don't know whether the cable had been connected to the miner; is that what you are saying?-- Yeah, the machine supply cable was not plugged into the miner at all. There was no power on the miner whatsoever. As to the motor, I'm not too sure whether John had connected it or was waiting to connect it.

That's the motor to the miner?-- The motor on the miner, the cutter head motor, yes.

But the one thing you can be sure about is that there was no power to the miner after these repairs were completed and up to the time of the explosion on 7 August?-- That's correct. That cable was actually plugged into the ratio feeder and they had used that to flit the ratio feeder to the position it was in when the explosion occurred.

Was there some notation or tag put on the miner by John Hearne, an electrician who carried out some of the service?-- That's correct. There was a danger tag put on the receptacle and that's the receptacle on the miner itself I'm talking about, and John had put an "out of service" there and labelled it that the cutter head motor was disconnected.

He was the last electrician to go near that machine?-- Exactly.

Could the witness see Exhibit 8, plan 45/19, please, Your Worship? You were informed by John Hearne, were you, as to the location of that miner?-- That's correct.

Now, if you look at that, Mr Evans, you may just see that's a plan of 512 and then that part of 510 that's just beyond the seals of 512. If you go to cross-cut 4 in 510, that's looking straight up in front of you, one, two, three, four?-- Right.

You will see an indication there as to the location of the miner backed into a cross-cut off that roadway, the man and supply road in 510; is that the location that you understood the miner to be placed in when it was being worked on?-- That would be the situation, yes.

It's been backed into that roadway; is that right?-- That's correct.

Backed into the cross-cut, I should say, with the heads projecting into the man and supply road?-- That's correct.

You can give that plan back to Mr Dahlke, thank you. Now we come to another aspect of matters dealt with in your statement. From the electrical shift report for 5 August there was a notation that repairs were conducted to the tramming motor cable on continuous miner 3 which was located in 5 South. Can you enlarge on the details of that report?-- Yes, the protection hose over the motor machine cable had been damaged. The outside had been cut and we had taped over the top of it and then tied that cable back into the machine itself with cable ties and it was regarded as what we call a temporary repair. We would have attended to that at the first down time or the first planned down time or the next weekend, whichever would have occurred previous.

Was there any risk associated with that procedure at all, that there might be any shorting out or difficulty with cable flash, I think it's called; is that right?-- No, it's quite a safe procedure. Your cable inside isn't damaged at all, it's only the protection hose that's over the outside of that cable and it's a recognised practice in the industry as a temporary procedure and that's why you record it in shift reports, so that people are aware of it and it can be repaired - or you can pass it on to production people to help fill in their schedules.

That was on 5 August. Do you know if there was anything further done to that prior to the time of the explosion on the night of 7 August?-- No, there was nothing done with that. We had a fairly full schedule that weekend with reticulation changes and we were running with a very minimal workforce for that weekend so that job would have been pushed a little bit further down the line of priority.

Going over to page 4 of your statement you do mention there that your section in the mine looks after the calibration and maintenance of the Sieger AFDs and the MSA minders?-- That is correct.

Can you tell the Inquiry the program that you adopted for that, the regularity of your maintenance checks?-- Yes, these - both the Sieger AFDs and the MSA minders, the ones that were available and were not in use by deputies were calibrated once a week. We staggered this around with the electricians that would be doing it so that one week you pick up the day shift - pick up the afternoon shift/night shift and then, of course, the next week you would pick up the other ones that you

wouldn't get. They were - it was a schedule maintenance thing. It was a statutory thing and it was recorded in a mine record book. When I say a mine record book, a book for recording mine records.

The calibration was carried out according to the instructions with some span gases; is that right?-- That's correct.

Every six months were the instruments returned to MSA for service and a complete calibration?-- Yes, that's required, yes.

Now, I want to ask you about incidents that were recorded in mine records involving damage to the shuttle car cables. Can you say how many of those there have been or there had been between - in the course of 1994 up to 7 August or thereabouts?-- Yes, there had been six reportable incidents, only five of which dealt with mine trailing cables. The sixth one was a high voltage cable and - could I refer to this - to a note here?

Are they some notes that you have made from the records, are they?-- Yes.

Yes, certainly refresh your memory from those?-- It was six. There was one high voltage, one miner cable and the other four were shuttle car cables.

What is it that causes the difficulty with the shuttle car cables? I mean what's the most common cause of the difficulties, I suppose I should ask you?-- Do you mean something like running over your own cable or a cable reel stopping?

Yes?-- Well, the major problem we had was cable reels either jamming up with mud or stopping or having mechanical failures that would stop the cable reeling in and the car going over its own cable. You couldn't say that was in every instance, but they would probably be major problems.

There is a cable reel on the machine itself; is that right?-- That is correct.

And is that designed to reel the cable in as the machine moves towards the cable anchor point or whatever it might be described as, and to allow the cable to reel out as the machine moves away?-- That is correct.

In other words, to keep the cable up off the ground and to keep it reasonably taut?-- Yes.

If the cable reel gets jammed and the machine moves away that stretches the cable, I suppose, and causes a rupture of some kind?-- It can do, yes.

On the other hand, if the cable doesn't reel in then the cable stays out and the machine can back over the cable and cause some damage that way?-- That's correct.

So is it important to ensure that these cable reel devices are properly operating at all times?-- Yes, that is correct.

Now, have there been some changes in the way that - in the method sought to overcome the problems with the cable reels?-- Yes, we had taken a couple of precautions - or instituted a couple of things. We had fitted pressure gauges registering cable reel pressures and they were mounted in the cab in with the driver so that he could check whether these pressures were right or not, and we also had installed what they call a cable reel motion detector. It was a proximity switch that would - once the car started moving and the reel stopped the proximity switch would indicate to a light that we had stopped and the driver should stop at the same time.

So, it was in fact a light that came up on his dashboard or

somewhere there where he could see it; is that right?-- Yes. We started off by putting only the one light in the machine and it was working okay, but the last car that we had worked on and put this on was a car on the surface, car 23, and we had established two lights on there so that if a driver - whichever way the driver was facing, he was facing an alarm light so he would actually have it in his eyes. You were depending upon sort of peripheral picking up of it otherwise.

Now, were these motion detector or motion detection devices fitted to the car that was being used in 5 South?-- No, we hadn't got around to those.

But what about the pressure gauge?-- I can't say about the pressure gauge. The mechanical people would be able to tell you about those cars.

You don't know whether they were fitted like the ones in 5 South?-- No, I could not say that.

Now, just one further thing that's mentioned in your statement there is that after the explosion, the first explosion, late on 7 August, the Dip 1 conveyor belt continued to run and the top section of the travelling road lights, I think, in the main dips area remained on after that explosion. Would that be normal?-- No, it should not have - they should not have been on, no.

There would be some system in place for the power to be disconnected; is that so?-- Yes, there was.

And do you know what happened on this occasion?-- I can't say with any - I can't say definitely what did happen. The only thing I would say is that the actual conditioning unit that supplies a tripping to those two pieces of equipment is connected to the flow meter on No 2 fan. Now, if No 2 fan had kept windmilling and No 1 also windmilling, it wouldn't have fallen to the necessary trip point on the conditioning unit to take those out, and then the power - the emergency power coming back on at the fan house would have kicked No 1 fan in and that would have just kept pulling that level up and we wouldn't have had a trip in that instance.

So, the power wouldn't have got down to the point where it would have tripped?-- Well, not the power so much as the actual flow through the fans. It had to fall to a certain set level of flow on a Kent transmitter before those units would be tripped out by the conditioning unit.

I think you mention early in your statement that in fact the park brake had been removed from No 1 fan, so it's quite likely that that continued to turn at a faster rate than normal before the emergency power -----?-- That is correct, and that would keep No 2 pulling also. Any run on any one fan because of the vane set-up would allow the other fan to keep turning over also.

I have no further questions, thank you, Mr Evans.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Evans, just one quick matter. You mention in your statement that there was no event recorders in operation at the mine; is that so?-- Yes, that's correct.

What do you mean by that?-- Well, I understood the question at the time coming from the person that asked me that to be in connection with the ventilation fans.

I see. Did you mean to imply by that response that there is nothing on the fan that can indicate when the power to the fan is interrupted or the fan stops for any reason?-- That's correct.

Which would make it impossible, unless you were there at the time the fan stopped, to know the time it stopped?-- That's correct.

In your opinion, would it be useful to have such a device connected to the ventilation fan for the mine?-- Yes, I think it would be.

It would perhaps make investigation of an incident such as this much easier by being able to determine accurately the times of varying happenings in the incident; is that so?-- That would be so.

Likewise, would it be useful to have some method of recording ventilation pressure, volume and temperature as well as barometric pressure associated with the operation of the fan?-- I know you asked for pressure, flow, and you asked for barometric pressure also.

Yes?-- Yes, that would be advantageous also.

That is, to have a record of those matters?-- Yes. Even Sharp recorders would have been handy.

None of that is currently required by legislation, is it? It's not a requirement of legislation to record those things?-- Not as far as I know.

Thank you.

CROSS-EXAMINATION:

MR MARTIN: Mr Evans, just a couple of things if you would. The BM1 alarm that you spoke about, where did that alarm?-- It alarmed on the surface in two places. It came up on a monitor screen which was part of the Dupont supervisory system, and it also operated on the Con Log and set off the siren.

Would you just tell us, please, about the monitor screen part of the Dupont system, where is that?-- That's situated in what we call the instrument room facing out into what is known as the starting point. It displays at all times the status of the conveyors, overall a line status of the conveyors to show which are running and which aren't, and it also has on it two other things. It has whether the pump is running at 9 cut-through, I think is the area, 9 cut-through 5 South, and it also indicated whether or not the BM1 had gone off.

And the instrument room, is that the room containing the Unor system?-- Correct.

Is that separate to the Unor system?-- Certainly.

So, you might have the Unor screen there and this other monitor screen that you are talking about adjacent to it?-- Yeah, they were probably separated by about three foot.

And you spoke about the Con Log as well. Where is that located, or more specifically in August 1994?-- Well, the Con Log - it's very hard to describe the layout of something you haven't seen, I suppose.

But is it on a wall?-- Yes, it is on a wall.

On the undermanager's wall?-- No, it is in the instrument room.

Within the instrument room?-- That is correct. That is, the annunciator ~panel for the Con Log is in the instrument room, yes.

So, if one is in the instrument room and going out of the instrument room, does he then walk into the undermanager's office?-- That's correct.

So, as one walks out and approaches that door, where is the Con Log?-- The Con Log - if you approach that door, as you reach the door going to the undermanager's cabin the Con Log would be on the wall to your right-hand side and behind you.

The right-hand side and behind?-- About six foot behind your head.

Is it visible from the undermanager's office?-- Certainly. There is a clear glass panel inserted in the door.

So, if one were sitting at the undermanager's desk would he see it; that is, the Con Log on the wall?-- Well, mainly you would hear the siren which would then make you go to the door to see which annunciator light was flashing.

All right. Assuming one didn't hear the siren, would one see an annunciator light flashing from the undermanager's office if he were sitting at the desk?-- Well, no, you are facing away from it.

All right. Well, you know the area and I don't?-- I'm sorry, yes.

You spoke about a siren. Are a number of systems or a number of alarms fitted up to that same Con Log?-- You mean with different origin points?

Yes?-- Yes, they were.

Including an alarm from the Unor?-- Correct.

I don't want to unnecessarily take either your time or the time of this Inquiry. Mr Robertson is giving evidence soon and I have a number of questions to ask in relation to the Unor system. Should I ask him - would he have more expertise or knowledge than you?-- You have got to look at two things here. First of all, I bought the Con Log, right, and I bought it for specific alarms. We monitored a lot of things like the fact of we had low trip faults in our low cut-sub station or low faults over on our high wall subs. They were necessary - the Mines Department would ask if we did this. We monitored the fact that the fans had stopped and we monitored the fact that the DA had started up, and the Unor was something that was only latched onto it. Now, I could say to you quite reasonably, definitely ask Mr Robertson about it, but you have got to remember that it was only - you are going to ask him about the Unor, not about the Con Log, because the Unor is only latched onto the Con Log itself.

I am going to ask about both?-- Well, right.

Well, talking about the Con Log and the latching onto the Con Log of the Unor alarm system, just correct me if I am wrong. If there is an alarm on the Unor, because of the latching on, the Con Log alarms?-- That's correct. The annunciator panel for the Unor will flash. It has - it's a repeated flashing, and a siren goes.

Well, if the siren didn't go, what would be the cause of that - on an alarm that is?-- Well, you would have to have lost your supply to your siren.

If the annunciator - if the Unor system is working and the siren is not, what does that suggest?-- Well, I see which way you are going now. You have got two situations - wait on. When you get an alarm on the Con Log panel, your first action is to mute the siren and you press what is known as the accept button.

Is there an accept button on the Con Log?-- There is an accept button on the Con Log and there is a remote accept button in the undermanager's cabin.

So, by either of those means the siren could be immobilised?-- That is correct.

Without there first being an alarm on the Unor?-- Would you repeat that again?

Without there first having been an alarm on the Unor?-- I seem to be sliding away here. Well, I seem to have lost the plot. No, no, no. It's just that if you get an alarm on the Unor, you will bring up the alarm on the Con Log, correct?

Certainly. I am asking you?-- Right, you will, you will, yes. You can accept it, right, and then you can get the situation where if you don't - if you don't reset the Con Log, another alarm following through behind will not sound the siren.

I understand that much. I am just taking it one step further. You said there were two switches, in my simple parlance, which could immobilise the Con Log in so far as that particular alarm is concerned; is that the case?-- Yes.

And that was what I asked you before. Without there being an actual alarm appearing on the Unor which would then in turn trigger the Con Log, without that happening, in the state of non-alarm the siren could then be immobilised?-- No, no. You can't immobilise something that hasn't got an alarm on it.

I understand that, all right. Just to be quite clear then, if there had been an alarm earlier in the day, say, or at any time, on the acceptance of that and the non-resetting of the Con Log, the siren would not alarm on a subsequent Unor alarm?-- That's correct, Mr Martin.

Thank you. Now, coming back to what I said earlier about not wasting anybody's time, should I ask Mr Robertson any detailed questions I want to ask about the -----?-- Yes, I would agree with that.

Thank you.

CROSS-EXAMINATION:

MR MORRISON: Mr Evans, I don't want to talk about the Unor at all. I want to get back to cable flashes, if I may. There had been an incident - I am sorry, that's the wrong way to put it. There had been a number of cable flashes?-- That is correct.

Some caused by cables being run over?-- Correct.

Some caused by cables being actually physically ripped out of either the join to the machine or join to the shuttle car?-- There had been a miner cable that had had that happen to it, yes.

In the case of each of those sort of incidents, the volume at that stage in the cable is enough that you would get sparking, quite considerable arcing, melted copper and so forth?-- Yes, yes.

So, it's the sort of incident that could generate the ignition for an explosion?-- Provided you had that incendive mix in the general body.

That's another question, but let's just deal with the flash itself?-- Right.

It's enough by itself, assuming other things, to perform that way?-- Yes.

Now, because of that fact, cable flashes are a reportable incident if you get a spark escape into the atmosphere?-- That is correct.

So, you could have an internal problem within the cable that doesn't get to the atmosphere and that probably wouldn't be reportable?-- That's the way you would view it, yes.

And the converse is so, whatever happens gets to the atmosphere is reportable?-- That's correct.

Is it the case that there was a particular system to deal with the investigation into cable flashes at No 2?-- Yes. The situation had been viewed pretty seriously by our manager/superintendent and he had initiated a system whereby at the time of the incident occurring the electrician on shift, the undermanager on the shift, the deputy on the shift would do a primary investigation, they would take witness notes and they would write their own reports, they would notify the manager or the senior undermanager, and these reports would be then tabled for the day shift for when the manager came in. They would barricade the area totally off and there would be no coal mined in that area until the inspector had been notified and arrived on site, and then an investigating committee comprising the manager, the training officer, senior undermanager, mine electrician, maybe a mechanical engineer and the inspector would go down and would run a complete, thorough investigation of the whole physical side of it and then at a meeting afterwards would come up with recommendations from that inspection.

Now, in some cable flash incidences, for instance, where the cable is physically damaged by being pulled apart or run over, it would be a relatively easy thing, assuming you had an alternative cable, just to couple another cable in and you could keep going?-- That was the practice prior to that time we brought that system in, yes.

And the manager/superintendent you are talking about is

Mr Schaus?-- That is correct.

So, the system - he introduced that system?-- Yes, it was his idea, yes, that he would go that far down the track with it, yes.

So, in reality, the system he imposed would shut down production -----?-- In that section.

----- until the whole investigation was finished?-- That's correct, yes, particularly if the car was in a situation where it was across the wheeling roads and you would have no way of getting coal in that section.

So, even though in some cases you could just put another cable in and keep going, Mr Schaus wouldn't permit that until the investigation was done?-- That's correct.

And did he also have some activity in relation to the systems to do with anchoring cables?-- Yes, Albert was very, very positive in this area. He was well supported by George and by the training people with their work they did, but we were having problems with side anchoring. Albert brought up an idea of extending - putting extension cable on so that we would get a little bit more room to move so we weren't anchoring, side anchoring, and he also instituted a system where we would go back to anchoring at the boot ends. This also was to get away from rib anchoring.

Rib anchoring?-- Yeah.

What we have been discussing, is that really a safety feature?-- That is safety, yes. Sorry, I'm probably presupposing the next question.

Do it anyway?-- If you rib anchor, unless you are prepared to go to an awful lot of trouble with plates and double bolts and all other sorts of things like that, you will, in time, tear an ordinary bolt out of the rib. So, what you have is the bolt - the chemical bolts, they just come out, and you have got a cable plus a chemical bolt flying through the section itself.

Very dangerous?-- That's very dangerous, yes.

And the previous incident that we are talking about, the matter of investigation of cable flash, that's purely safety orientated?-- That's safety orientated, yes.

Now, the other thing I want to talk to you about is this: were you investigating at the time of this incident a change of your CO monitoring instrumentation - thinking of moving away from Dragers?-- Yeah, we had discussed that. When you say "Drager", I look at a different line. I look at what we call the MSA Minders, Mr Morrison. We had looked at alternative Minders which were a much better type of unit, but we had, as a company, committed ourselves to spare parts and to the usage of the MSA Minder for a period of time. It was an economic thing. As the Minders had aged - and this was the same as the AFD's - the AFD's were a portable monitoring unit, because they had had their day as far as we were concerned - and the same would have happened to the Minders and we would have moved ahead technologically.

They would be phased in; the equipment became effectively redundant?-- That was the understanding I had during discussions with Mr Schaus, yes.

You had, in fact, had some meetings with various representatives of the companies that produced this sort of equipment?-- Yes.

And one of those is MSA and another one is - sorry, what was the other name?-- Austdac.

Austdac. I have nothing further, Your Worship.

CROSS-EXAMINATION:

MR HARRISON: Mr Evans, you have told Mr Clair that you have actually prepared some notes from the company records in relation to the cable flash incidents for 1994?-- That is correct.

You have told us that there were six, one of which involved a miner cable and four of which involved cables to the shuttle cars?-- That is correct.

And what I'd like to ask you is this: is it apparent from your knowledge of those incidents whether some or more of them relate to what might be termed "error by the operator of the machine"?-- There was only one - of those six instances, there was one car and one miner cable that could have been related to operator error.

And dealing with the shuttle cars if I can, firstly, would it be the case that the others related to some failure - what I might term "failure in the equipment"?-- Two of them were related to mechanical failures, and the last one was something I've never seen in 22 years in coal mining, and that was a flat - what we call a stone flat off the roof stood upright as the car went over and sheared off a body cable going to one of the tram motors.

And that's something you have never heard of before?-- I have never seen that, no.

What about the other two? Briefly, what were the mechanical problems there?-- On one particular machine, we had an intermittent hydraulics problem which stopped the reel turning. You would never know when you would get it and we presupposed it was dirt in the hydraulics that was blocking a needle valve somewhere down the line. Your reel would stop, you would jam up. If you were travelling one way, you would tear the cable; if you were travelling the other, you would run over it.

I take it that's the sort of problem that you are not going to know about until you actually have your flash; would that be the case? It is not something you would readily detect unless and until there was a cable flash?-- Well, yes, this was - that sort of thing led us to doing what we were doing because we can analyse these things and then you would say to yourself: instead of, say, having two or three cables killed because you had this intermittent fault, you would have done some sort of work on it, some sort of analysis - you can say, "Maybe it is this and maybe we can look at this and do this right away." This was the whole idea of the whole system that Albert set up - that we look at damage and we assess it, and from that we build out a pattern and we can build a preventative maintenance pattern, if you like, or a more responsive feel to any situation that come along.

You say "set up". Had it been set up, or was it in the process of being set up?-- We were collecting data at that time - Joe Barraclough was. We were looking at everything. If we had, say, cable tears, we would assess why, we would make notes on that so we could feed data back in. We were endeavouring to try and set up a much better system than we had to try and analyse why we were getting problems, and from there you could take that to safety meetings, which was happening. Everything was made a matter of being a safety minute and it was also discussed at toolbox meetings with the

miners and also at monthly safety meetings.

Were there other areas of what I would term mechanical failure, or failure in the equipment that we haven't discussed in those incidents in 1994?-- Well, yeah, there was the time they left a packing - they left - oh, what do you call it, a body spacer out of a fair lead roller, and disallowed the fair lead roller to flop around, and the cable went under the edge of the fair lead roller and got torn in half, and from that we were instituting a system where all components of a fair lead roller were put into a plastic bag, so that if you were changing out a fair lead roller, you would have all the parts there. Instead of having four different requisitions to write out, you would have it all as a kit.

And this is something that you were gradually working on?-- Yes.

You have mentioned earlier that some of the more obvious examples, for instance, was someone may go the wrong way and run over his own cable?-- That has happened.

Or fairly rough use of the shuttle cars could perhaps result in a cable flash; is that the case?-- Well, I would be less than honest if I said no.

Now, you have told us about the reportable incidents for 1994. How does that compare, say on average, with previous years, to your knowledge, bearing in mind that we are talking about, roughly, the first half of 1994?-- Well, I suppose it doesn't brush up too dusty, but we averaged - and I suppose the figures are available somewhere - but to my memory we were averaging somewhere in the region of seven reportable incidents a year.

And the ones you have made notes of, over what period of time did they occur? From when till when?-- That was over a five month period.

Just the first eight and the last eight?-- 2/2/94, and talking only about the trailing cables on the machines, it would have been the 6th of the 7th and the high voltage cable was on the 10th of the 7th.

Thank you. I have nothing further, Your Worship.

MR CLAIR: Your Worship, just some questions.

RE-EXAMINATION:

MR CLAIR: Mr Evans, I am not going to be as kind as Mr Martin in letting you off the hook on the Con Log operation because you did say you bought the Con Log and installed it; is that correct?-- That's correct, yes.

I know Mr Robertson's area seems to be in respect of the Unor system and certainly the way it reacts with the Con Log, but I want to follow up this position where there's an alarm which sounds - and, of course, the Con Log not only serves the Unor points that might alarm - that is, the alarms that might come from the Unor system - but it serves a whole range of alarms, I think you've said?-- That's correct.

I understood you to say that if you had an alarm from any point that caused the annunciator light or one of the annunciator lights on the Con Log to flash and, in turn, the siren to go off, does the Con Log feed the signal through to the siren; is that correct?-- That is correct.

The actual siren side of an alarm can be deactivated by taking some step in relation to the Con Log?-- By pressing the accept button.

The accept button can be pressed at the Con Log itself?-- Correct.

Which is just inside the Unor room - about six feet inside and to the left as you go in from the undermanagers' office?-- That is correct, yes.

Or it can be deactivated from a remote button in the undermanagers' office?-- A push button station just to your left-hand side as you go through the door.

In the undermanagers' office?-- That's correct.

Did I understand you to say that there would then need to be some step taken to reset the Con Log?-- Yeah, you would have to remove the alarm condition that had brought up that annunciator flag. You have got to remove that first, and then you push what they call the reset button. Now, if you don't remove the alarm condition that is holding that annunciator flag up or the window up, the thing will just drop straight back into alarm again.

When will it drop back into alarm again?-- Straightaway.

Straightaway?-- Mmm.

So that the steps that you would take would be - if you had an alarm would be to, first of all, activate one of those buttons, either the Con Log or the remote button?-- Correct.

To deactivate the siren?-- That's correct.

Do you have a certain period of time in which to, as it were, eliminate the alarm condition that caused the Con Log alarm to trip and the siren to go off?-- No, that's just a repair job. Like, you know, say, for instance, you had low cut-sub volts - this is on our trip batteries for our circuit breakers - the deal would be you can either lift off the wiring which has caused this alarm or charge your batteries up so the voltage rose.

What happened with the siren in the meantime?-- If you haven't reset the thing - if you haven't muted the siren, the siren will still keep going.

What if you have muted the siren by pressing one of those buttons?-- Nothing would happen. You just repair the problem, whatever it may be - remove the alarm condition that has brought that window up, and then press your reset button.

And then press your reset button?-- That's correct.

So, that alarm is not going to go off on any further alarm condition arising, whether from the same source or a different source, unless you go and reset the Con Log?-- That is correct.

So that you could well have a situation whereby an alarm goes off on the Unor system because of one of the gas level set points being reached, which in turn causes the Con Log annunciation light to flash and also the siren to go off, and then that siren is deactivated by pressing one or other of those buttons, and then it may be that the alarm is accepted on the Unor system, which takes away the condition, as it were, that caused the siren to go off through the Con Log, but if that Con Log is not reset, then another alarm condition could arise, whether it be in the Unor or from some other source, and there would be no siren; is that so?-- I have agreed to that in your previous question, Mr Clair, and I really - I'm thinking about it now. I said "yes" when you asked me that question and you have just broadened it out for me. I really can't say whether or not - no, I would have to go back and retract. What I would say to you is if you had an alarm condition on the Unor and you had accepted it, and you cleared the alarm condition and you didn't reset the Unor, if you, say, lost - or say your fan started up, then you would, I think, get the alarm coming up again, but if it was another Unor fault came up, it wouldn't alarm because you had muted that channel for that particular alarm.

I see. So, it is only the channel that you have muted?-- Yes.

If you don't reset your Con Log, if another alarm came up on that channel - on the Unor?-- Yes.

As opposed to what I was saying before from any source?-- Yes.

If another alarm came up on the Unor, then, in the absence of the Con Log having been reset, there wouldn't be any tripping of the Con Log, and there wouldn't be any siren?-- That's correct.

I see. So, it could well be that there might be a series of three gas alarms in a period of half an hour and, just summing-up the situation that would appear to exist on the evidence, it could be a series of three gas alarms within the Unor within half an hour, without sirens necessarily going off on the occasion of each of those, the explanation perhaps

being that the Con Log hadn't been reset?-- That would be possible, yes.

Okay. Thank you, Mr Evans. Thank you, Your Worship.

EXAMINATION:

MR PARKIN: Mr Evans, how often would you burn out motors on a continuous mine at Moura?-- Well, more than I liked, anyhow. We had a bit of a problem with voltage. We had been running - due to our reticulation set up at a very low voltage level, we were running at times with 800 volts on the motors and sustaining quite some incredible damage to the internal parts, like short-circuiting rings and things like that. We had corrected that and gone back to 1,000 volts, but because of our voltage problems, we did a lot of damage to motors that probably other pits didn't.

So, it was purely due to voltage fluctuations?-- That's correct, yes.

With respect to the shuttle car cables, these are obviously cause for some concern, and by your own admission last year, you had some seven reportable instances?-- That's correct.

Is that high by industry standards?-- I don't really know, because I haven't got any figures from any other colliery.

Let me ask you - to put it another way, can you remember how many you had the previous year to last year?-- I think we sat in on around six or seven a year.

So, on average, about six or seven per annum?-- That's right. We adopted an honesty situation with these. We reported whenever we had them.

Can you describe briefly the program that you had to minimise these occurrences at Moura?-- What, apart from what I've said before?

How did you go about, you know, the problem itself? Could you explain that in a bit more detail?-- Well, which part of the program?

Well, the program to actually reduce these occurrences?-- Well, besides looking at putting things like pressure gauges on the machines, cable reel motion detectors, and instituting an investigation and analysis of any repairs, we were going very heavily into trying to have worker orientation through safety meetings, through showing cables - we got to a stage where in some of these instances we exhibited the cables at the starting point themselves for the troops to see.

What you are saying is you involved everyone in the process?-- Well, that's the only way you are going to get results.

Thank you. Just one final point: how often would you attend safety meetings at Moura?-- We had a set-up where we had - we had a safety contact you had to have once a week with every one of your men, be it miners or electricians, and then we had a major safety meeting which would run anything two to three hours once a month.

Thank you.

EXAMINATION:

MR NEILSON: Mr Evans, I want to talk a little bit more and explore some avenues about this phenomenon of cable flashes. I mean, obviously there is a great deal of concern that arises in an underground coal mine where you have a cable flash for the reasons that have been discussed here with you previously - that it is a dangerous circumstance to have a flash from a cable because it produces all of the right ingredients, or part of the ingredients to have an ignition. You were asked that question, I think, by Mr Morrison, and you did answer, "provided you had the right mixture of gas in the general body of the air"?-- That's correct.

Is that correct?-- Yes.

What I'd like to explore with you is the likelihood of a cable flash in the circumstances that you have found on average, you know, the six or seven that you average per year, the likelihood of an ignition actually occurring from a cable flash because - can you explain to me if there was a sufficient percentage of methane - and you would agree that the explosive range of methane is between approximately 5 and 15 per cent?-- Yes.

That's correct, yes?-- Yes.

What process or what safety mechanisms would have to be breached or would there have to be a failure for that type of mixture to be able to come in contact with a cable that may be damaged and cause a flash? When I say "cable" I'm talking about not only car cables, but also mining cables as well?-- Yeah, well, the type of mixture you are talking about there I think would have been very hard to get in Moura Mine because we ran Trolexes and Bacharach monitors on all our miners. You know, we had deputies down there. I just can't see that we would get that volume.

If you were going to get that - sorry, not volume -----?-- I meant mix, I'm sorry.

Quantity, yeah. Where would it most likely come from? If you took a bord and pillar operation and you went down and you had your miner and your car behind it and you were going to get an emission, it would be fair to say it would most likely come from the coal face?-- Coal face or - you get a fair amount of fizz when you are cutting at Moura from the tail, coming over the tail of the machine into the car too.

Well, would you ever experience a 5 per cent methane mix coming out of the back of a shuttle car?-- I'd be about five and a half pillars away if I did. You would not.

So would it be fair to say - and I don't say that this is the only set of circumstances, but under normal conditions if you were going to get such a mixture it would be emitted from the coal face. I mean is that -----?-- Wait on.

I'm not trying to put words in your mouth?-- Well, I'm not a technical expert on coal mining. I'm not a production man, but you can get blowers in the floor. You can get blowers out the side rib. It's not only just out of the coal face as such. You are talking about the immediate cutting face.

Yes?-- If your ventilation is up you shouldn't be getting that volume there anyhow.

I may have not put the question to you correctly. I'm asking, is the most likely place to be the coal face? I mean if you are going to get a blower in the floor back from the coal face you would know that that was present in any case because it would more likely blow as you expose that particular area, wouldn't it, or don't you know that?-- I've seen blowers - I haven't seen blowers in the history of Moura No 2 Underground Mine. We did have a blower ignite in the floor when a stab

jack was put down on a cable and it sent the - we had a fire. That is history.

Nothing is impossible?-- That is right.

So can we talk about probability rather than possibility?-- Righto.

So I will go back to - I mean if you don't feel comfortable with the question then just say so. Under normal circumstances, when extraordinary emissions or quantities of gas are found in coal in and around a coal face they normally are emitted from the coal face because that's the area that you are continually exposing to new circumstances?-- That's right, because you would be getting the gas coming out of the face but if your ventilation is up to scratch you should be whipping it away anyhow.

But in the event that your ventilation is not up to scratch which from time to time can happen?-- Roger.

And you can often get a mixture of gas that will come back to an area where cables may be exposed. I mean it's probable?-- Yeah.

Under those circumstances what I'm asking you is what safety devices do you have that would have to be breached or found to fail for an ignition to take place through a cable flash?-- Your first line of defence would be your Trolex on the machine. Most of our miners had Trolex gas monitors on them and we were looking at setting them up with Trolexes both sides instead of just one side. You would get that go off. That would just trip your power clean off. Your battery would hold up and indicate what you had and people would know you had a real problem.

The Trolex is on the cutting head?-- Sited directly above the cutting head motors. They stood proud of the cutter boom deck itself. They were above the line of the cutter deck.

Approximately how long have those devices been fitted to the continuous miners underground at Moura?-- Good Lord. Gee, I'm going back -----

Approximate?-- 15, 16 years.

During that period have they ever been known to fail?-- They have been known to malfunction, like particularly the Bacharachs, because of water getting into the sinter head, but that indicates to you on the panel you've got a malfunction and at that stage the machine would be withdrawn and the work would be carried out on that particular piece of gear to find out why. Again it wouldn't go back on coal face until such time as the monitor was working correctly.

Okay. So if they fail or if there is a problem or a fault with them there is another system to indicate that?-- Yes.

Well, the system you have to indicate a failure, does it ever

fail?-- I've never seen it happen, but, look, I don't know.

You've never seen it?-- I've never seen - I've seen them operate, but I've never known of one failing. We have no historical records of that.

So in the 16 or 17 years it has been known for the Trolex to malfunction -----?-- I'm talking about Bacharach. Bacharach or Trolex? They are two different units. Bacharach was our first units then we went upmarket and went to Trolex because they are a far better unit.

So let's just call it a monitoring system?-- Right, Mr Neilson.

So in the 16 years it has been known on some occasions for the monitoring system to have failed?-- Yes.

But at all times the alarm system, or whatever the system is, to let you know that that failure is there, it has always operated?-- Correct.

So it's fair to say that the likelihood of that device, that protection mechanism to actually fail without it being acknowledged hasn't happened?-- That's right.

So if we go back to my original question, the likelihood then, and I'm asking you this question, the likelihood of a flammable or explodable mixture of gas being able to be emitted sufficiently far enough back from the face to come in contact with a possible source of ignition from a cable flash, I mean what is the likelihood in your view?-- Look, I've been in coal mining 22 years and I've finally come to the conclusion that anything's possible. You don't know. You have to take every precaution as if it is going to happen, particularly - we were a gassy mine. I think we are one of the few in Queensland. We accepted the whole situation pretty seriously and we didn't allow for the fact that it wasn't going to happen. We treated every situation that it may happen and even though, as you are probably indicating, we had reportable incidents in areas where there was no possible chance of ignition, we treated the whole thing as the Mining Act required it to be treated and also we treated it seriously because we didn't want the possibility there. We erred on the side of caution, I suppose, but I would much rather do that any given day than not.

I accept that. You still haven't answered my question. My question to you is, and I repeat it: given all of the circumstances that we have just talked about, and particularly in light of what you have just said, what you just said to me of the manner in which you do treat the possibility of something happening, what in your opinion is the likelihood of the circumstances that I previously described happening? I mean is it very likely or, you know, extremely unlikely? How would you describe it?-- Can I have five bob each way and say probably extremely unlikely but it's possible at some time. I mean if I say to you that there is very, very little chance of that I'm sort of saying that what I did for the last 20 years

was wrong, you know.

You don't need five bob each way on a two horse race?-- No. There is possibly no chance at all, Peter, but it's just one of those things. We went that way.

Thanks very much.

EXAMINATION:

PROF ROXBOROUGH: Mr Evans, why would the running status of the Dip 1 conveyor and the travelling road lights depend on the main fan stopping?-- The lights - it's a requirement of the Act that any power - any circuitry underground other than intrinsically safe circuits should be isolated from supply in the event of a failure of the fans. Now again I go back in history, the Dip 1 belt, the only parts of that going inbye that would have had power on them would have been the belt control system which was an intrinsically safe circuit, but at some time in years past we were asked by management, and more or less as a motherhood thing so far as the unions were concerned, to make certain we didn't have any belts running underground during power outages.

Now, you, in answer to Mr Clair, were giving an explanation as to why the fan could be off and the Dip 1 conveyor still operating?-- That's correct.

And you attributed that to possible windmilling of the fan?-- That's right.

Does that mean we have a scenario where the windmilling is turning the fan motor into a generator and pumping power into the system?-- No, because you are isolated from the circuitry. Your mains breaker is isolated. You are not putting power back into the system itself.

How do you relate then the windmilling function maintaining - possibly maintaining the Dip 1 conveyor operating?-- While your fan is windmilling you are pulling flow through your fan housing. The flow is recorded on a Kent transmitter which is a 4 to 20 milli-amp output. That Kent transmitter has got two recording stations, one in the vent fan house and the other in the bath house and we inserted a conditioning unit in there to act as a trip unit. We inserted that in the loop, the 4 to 20 milli-amp loop, and then we set an arbitrary point on that system so that we would really maintain our power until we dropped to that point. Now, if you kept your fan blade running and - you can in circumstances, particularly if your vanes are open and your dampers have not fully closed, you can make the second off-line unit keep pulling - that's No 2 motor, make it keep pulling enough air so you don't drop below that trip point.

One final question, if I may. Is all of the electrical equipment used underground at Moura either intrinsically safe

or flameproof?-- The only things that were not intrinsically safe and not flameproof were lights in certain areas of the mine. We had an exception from the Mines Department to use them. We had an approval to use them and they were not to be taken within 200 metres of a coal face. They were a type of like - they are called a Dip 40 and they were made by Burn-Brite, I think. We had, after that time, gone to a light that had a QMDA approval which we were using closer into the sections.

What voltage would those lights be?-- 110 volt.

Thank you.

EXAMINATION:

MR ELLICOTT: Can you describe to me briefly the criterior by which a cable flash becomes reportable?-- It's the emission of arcs or sparks outside of cables on closures. I think it's a rule in the Act underground electrical rules.

So it's wording like arcing external to the casing of something?-- Yes.

Did you have instances where other cables, in your words, were killed, but there wasn't external arcing and therefore they weren't reportable?-- Yes, but those cables were only found when they came to the surface for repair. You can get this situation where if someone drove over a cable you can damage the cable inside, it may trip out when the person drives over it, you can reset the earth leakage and you can put the cable back in use. Now, the continued usage of that cable will finally - the thing is weakened, all the internal sheaths and that are weakened and it can blow out later on and you won't find it until you actually put it through the sheath tester and you get the fault point, and then when you open it up you can find it blowing 10 foot either side with carbon and rubbish 10 foot either side. It's quite possible. I've seen quite a few of those over the years.

Can you not have cables fail in service without there being external arcing?-- Yes, you can.

Can you give me an idea of whether you had any of those and to what level those occurrences happened?-- We hadn't had that type of fault for a particularly long time. We had adopted a policy which is a bit slash and burn, I suppose, but if you drove over a car cable or a miner cable, that cable was changed out and sent to the surface for immediate test, check and repair, and doing that we saved ourselves a lot of grief with that particular type of fault.

Were those instances investigated with the same rigour as the reportable ones?-- No, it would be recorded on the machine - on the cable record sheet. It would be recorded on there that it had been run over and that we had found this particular

damage, but it wouldn't be - agreed, it wouldn't be pursued that way.

But aren't the same processes involved in both things, both the reportable and non-reportable ones?-- You are looking at a change in culture. The way we were approaching things in the last year and a bit was a different culture to before, and as I said to you, it's been quite some time - it would be five or six years since we had one of those faults where we blew the cable inside the casing without it coming outside, but we had sort of started to - as I said it was a culture. We were looking at doing things a bit better, a bit smarter and possibly these things would be recorded and trended.

But you were still changing cables out?-- Oh, yeah.

Was Moura's cable repair bill of some concern?-- Well, we came in under budget every year, and I wasn't fudging either, but we did come in under budget. No-one ever spoke to me about it. We looked at going outside at one stage. Apart from the fact the boys weren't real keen about it, economically we wouldn't have cut much better than what we did. We had a good crew, and when they weren't repairing cables, they would doing something else electrically.

So, the cables were repaired in-house?-- In-house, yes.

You mentioned in your evidence, or it came up that you were considering a replacement for the MSA Minder?-- Yes.

Can you tell me if those potential replacements included provision for determining carbon monoxide?-- No, I couldn't say offhand. No, we were looking at CH4 and O2.

Only?-- Well, that was the only models we were shown. Whether or not the manager and the senior undermanager would have gone further down the track and looked for something a bit different, well that would have been entirely up to them. What they would request is what we would get.

That's all, thank you.

MR CLAIR: I have no further questions, Your Worship.

FURTHER CROSS-EXAMINATION:

MR MARTIN: Your Worship, I would like to ask one or two more questions before the resident expert on the Con Log departs. The source by which the Con Log alarmed on the Unor was by some electrical cable, I take it?-- Correct.

And what was that electrical cable plugged into on the Unor? Was it a plug?-- You will have to ask the resident expert on the Unor there, Mr Martin.

One more question then. The Con Log ran on electricity obviously?-- Yes.

So, it had to draw a source from somewhere?-- Yes.

Was that capable of being turned off?-- No. The Con Log itself ran off an inverter that was down in the switch room in the far end of the bath house, and in the event of the mains power going off, the Con Log could be supported for anything up to 12 to 14 hours off a back-up battery supply.

But was there a switch for it?-- No.

Thank you.

WARDEN: Thank you, gentlemen.

MR HARRISON: Can I just ask one very brief matter, Your Worship?

WARDEN: Thank you.

FURTHER CROSS-EXAMINATION:

MR HARRISON: The incident involving the stab jack, do you know roughly when that was?-- That was approximately a month after No 4 blew up back in 1986.

Do you know roughly where that was?-- 5 North section.

Thank you, I have nothing further, Your Worship.

WARDEN: Thank you, witness, you may stand down. You are excused.

WITNESS EXCUSED

WARDEN: We will take a short break.

THE COURT ADJOURNED AT 3.39 P.M.

THE COURT RESUMED AT 3.54 P.M.

MR CLAIR: May it please Your Worship, I call Francis Maxwell Robertson.

WARDEN: While the witness is taking the oath, we won't fish finish this witness this afternoon, so we will terminate somewhere just after 4.30.

FRANCIS MAXWELL ROBERTSON, SWORN AND EXAMINED:

MR CLAIR: Your full name is Francis Maxwell Robertson; is that correct?-- That's correct.

Mr Robertson, you are the Electrical Foreman at Moura No 2 Mine?-- That's correct.

You first worked at the Leichhardt Colliery in about 1974/75 as a shift electrician; is that so?-- That is so.

And after that you worked in Townsville for a time with Wormald?-- That's right.

Then in April 1976 you started at Moura as an underground electrician?-- That's right.

And you were made Foreman Electrician in 1981?-- That's right.

And you have been there ever since?-- That's right.

Now, you had a range of duties in that role, no doubt?-- Over the years, yes.

In particular, one of your duties included looking after the Maihak Unor mine monitoring system?-- That is correct.

Are you able to say when that system was installed at the mine?-- The system we have at the moment was installed in 1987, from what I can remember.

Did it come under your care as from the time it was installed?-- I think I sort of inherited it.

When was that?-- When it was first installed I think there was quite a few of us involved with it, learnt how to operate it and maintain it, and after that it just virtually fell on my shoulders to keep maintaining it.

You were the person who - whether it was by some natural process or some organised process - you ended up with the main responsibility for it; is that right?-- That's right, yes.

Now, did you have some system whereby you conducted regular tests on the equipment to just verify its accuracy from time to time?-- The main test would have been when we did our monthly leak tests. I think most - I don't know whether people here are aware of how that works, but we go down to the end of each sample line and then check a known sample of gas into there and it comes up and registers up on the Maihak analyser itself.

Right. This is what has been referred to on other occasions as the span gas tests?-- Span gas tests, leak tests, yes.

The gases that are injected into the system have a known

proportion of component gases; is that right?-- Yeah, they are from a CIG bottle. It comes with a known proportion and we inject that.

And the purpose of those tests, you say, first of all, is they check for any leaks in the system?-- Those tests are to check the integrity of the tube bundle itself.

And are those tests also used to check the accuracy of the analyser?-- It can be used in that respect, but we do have other bottles available that were used for calibrations of the unit itself.

So that the principal purpose of the span gas test really is to put your gases in at the monitor points and then to make sure that those gases, first of all, get back intact?-- Mmm.

Thus demonstrating that there is no leak?-- Yes.

In any one particular part of the system?-- Heart.

And, secondly, does it give you some indication as to the amount of time that it takes for gases to travel from each of the monitor points back to the analyser?-- That's normally recorded, you know, the time frame of when it's injected into the line to when it appears on the screen.

I see?-- Up on the computer.

Now, you say that as far as the accuracy of the analyser is concerned, that there was a more direct way to check that and that was to use a bottle of known gas actually at the point of the sampling. When I say "the sampling", nearer to the analyser, up at the Unor system itself?-- We did actually have bottles of span gas situated out the back of the bath house. They were connected directly to the Maihak analyser and they were used for calibration of the unit itself.

How often was the unit calibrated?-- It wasn't any set time. They were random tests which mainly occurred if there was any drift in the readings at all, any known drifts in the readings that appeared on the screen. You know, if -----

How would you know that there had been a drift?-- Well, we would be notified either by the undermanagers or the deputies who are using the Maihak itself or reading the screen. They might say that the methane seems to be reading a bit high or the CO reads a bit high. There might be a bit of a drift in the zero line, which means - the way they eliminate that would be to do a calibration on the unit itself.

It's really of some importance to ensure that the analyser is reading correctly?-- That's right.

That's so, isn't it?-- Yes.

Now, you say then that one of the ways in which it might be realised that the analyser isn't reading correctly is that people who are taking other samples, for instance, a bag

sample, I think you referred to, a bag sample that would be put through a gas chromatograph, for example, or what sort of bag sample?-- It could be done by using bag samples. I think the most easily recognisable way was just by the screen itself. On the screen itself we had what was called number 14, I think, on the screen itself which is a pump point which is a point that was situated in the room next to the analyser itself which virtually just sucked fresh air. The quickest and easiest way to find out whether there was any drift in the gases would be to watch what the pump point read. If it had a reading of 3 parts CO, you would know that there weren't - there wasn't 3 parts CO in the room, so you would know that there must have been a drift in the zero line or whatever.

Well, that really - sorry?-- You know, there are other tests. The deputies were down there doing the tests in the returns, etc, etc, and they could compare what was down in the return with what was shown on the screen as well.

First of all there is a drift from the zero point that you say might be indicated by looking at what was known as a known point?-- Yes.

Was there any occasion when anyone said, "Look, point 14 seems to be reading abnormally, there must be something wrong with the analysis being done by the Unor system."?-- It didn't happen very often, but I know some of the deputies did remark to me at times, you know, "Can you just have a look at the Unor because it seems to be reading a little bit high."

As a result of-----?-- Whether they notice it by the screen itself, by the pump point, or whether they noticed by what readings were taken down below.

I want to come to that next, you see, but first of all was there any occasion that you can remember when there was some suggestion that the machine wasn't reading correctly because of the observations about point 14? You say that would have been one way-----?-- That would have been the easiest - I can't actually recall any occasions there might have been that situation.

You say the second way in which it might be realised the machine wasn't reading correctly is by comparison between the samples that the deputies were taking down in the various panels of the mine at the vent stations or the monitor points, and the readings that were showing up on the Unor screen?-- Yes.

These readings that were taken at the monitor points were readings taken with the Drager tubes; is that right - or at least as far as 512 is concerned?-- Drager tubes or the Minders.

The Minders when you are talking about methane?-- Yes.

Was there any occasion that you can remember when deputies mentioned to you that there was a difference between the readings they were getting, either on the Minders or the Drager tubes, and the readings on the Unor screen?-- Not actually on the Drager tubes, but, you know, I can recall the odd occasion when a deputy or an undermanager might have mentioned to me that there seemed to be some variation in the readings, but, you know, that's very seldom.

What would you do if that was suggested?-- I would check the Unor itself and do a calibration, just to make sure it was reading accurately. If there was any adjustments - whether I had to adjust the zero or the span, or something like that - well, adjustments would be made.

And you would do your calibration by using the span gas from the bottles that were permanently connected to the machine?--

Yes.

Well, that was really a system, then, of response to some suggestions of error in the machine?-- Yes.

Was there any regular program whereby the machine was calibrated, whether it was once a year or once a month or once every six weeks?-- On Maihak itself they did a six monthly service which was a full service. They went through the computer programs, they went through the gas analysers, checked everything out, made any adjustments, whatever. That was a regular six monthly service.

And they recalibrated-----?-- They recalibrated everything.

-----at that time. Do you remember when the last six monthly service was prior to 7 August?-- Approximately 23 June.

Just on that point about what can be done at the point of the analyser, is it possible to actually take a bag sample from somewhere and to feed that bag sample directly into the analyser and get an analysis done?-- It is possible.

Is there much difficulty involved in doing that?-- There is no great difficulty, no; it is just a matter of hooking into one of the spare lines that are there. The pumps on the Maihak are pretty strong, and you only get sort of one crack at it - you know, a sample bag itself.

But you could-----?-- It is possible.

There is really nothing to prevent you doing it?-- No.

It is not impossible to disconnect a hose or find a spare hose or something?-- No, I have done it myself, anyway.

You could have a fairly instant analysis on a bag sample if you needed to do so?-- That's correct.

Go and get a bag sample in the mine at some point and bring it up and do it straightaway?-- That's correct.

No great delay?-- No.

Now, I want to come back to these span gas tests. First of all, can you say how it was in doing those span gas tests that you could determine whether there was a leak in the line?-- Well, as I said, we put a known percentage of gas in and by looking at the readings that arrived up on the screen, if it - you know, if perchance it was 44 parts CO and we had a reading up on the screen that came through 41, 42 parts CO, we knew that the line was pretty well, you know, okay. If you got a reading of 20 or 25, you knew there was some dilution with air, so you would have to go and check the line and find out where the leak was.

Is there a separate line from each of the monitor points up to the analyser?-- The analysers, yes.

Can you tell me this: what quantity of gas is actually taken in on each of the samplings at those monitor points?-- I couldn't say physically what quantity of sample. The sample line is sampling all the time. You are getting air sucked out of the mine all the time.

All the time. It doesn't just suck in for a particular-----?-- No, all the time.

There is constant air flowing, or constant-----?-- There is constant flow.

Being brought up through each of those pipes all of the time?-- Yes.

Then at the actual system itself, what happens? You have got - I mean, if they were all working, you would have 20 different pipes coming into your system?-- Yes, that's right. They all go through a series of solenoids. Each sample line has got a solenoid on it. Whatever sample - whatever number is being sampled at the time, that solenoid operates and directs the air flow through the analysers itself. The other 19 solenoids just shoot it out to the atmosphere.

I see. Now, when the solenoid operates so as to provide a sample into the analyser, what would be the size of that sample? Is that something that you know, or-----?-- I wouldn't know.

For how long is the atmosphere sucked out of the pipe?-- Each point takes about a minute to go through, so, yeah, actually you are putting that sample through the analyser for approximately a minute.

So, there would be, in effect - depending on the rate of flow through the pipe, there would be whatever quantity made up-----?-- A fair volume.

By that rate of flow for a minute. So there would be a fair volume?-- Yes.

Is the whole of that sample all analysed?-- Yes.

In the one operation?-- Yes.

So that in terms of the sample that's collected at the monitor point, first of all, there's, you know, that - that is being pulled through that pipe all the time. Would you have a certain mixing of the atmosphere while the sample is being pulled up through the pipe?-- Yeah.

When I say "the atmosphere", that's the atmosphere within the pipe?-- Yes.

There would be a mixing of that. I suppose there are bends and turns to be negotiated by the air as it moves through the pipe?-- That's right.

So a fair bit of turbulence in there; is that right?-- I

don't know whether you would class it as turbulence.

Oh, well, going around corners and bends, there would be some mixing of the air as it comes up through the pipe?-- I'm afraid I'm not an expert on the-----

Well, I guess I'm asking you just from your knowledge of the system, but if you feel you can't answer it-----?-- Not on air flows, no, I'm not up with that.

Then, when the sample's actually taken, when the solenoid is operating and that sample is taken from the pipe, you are really getting, in the end result, a sort of mixing of whatever is an homogeneous gas within the sample area. Is it a big bottle that it goes into, or a big chamber of some sort that it goes into?-- No, it is a series of chambers in each analyser. There are four analysers there and it is just directed into each one of them.

Does it go into some central area when it is sucked in - when the solenoid opens and it is sucked in, does it go into a large central-----?-- No.

-----area, or it just comes through-----?-- Just through a series of pipes.

Then it is directed into four pipes?-- That's right.

Each one of those pipes is designed to analyse for a particular gas?-- Particular gas.

Well, then, it would be fair to suggest that at least as far as that sample is concerned, what you are getting by the time is goes into each of those four testing compartments is a fairly well mixed and homogeneous gas?-- I don't know whether I could answer that, but I imagine it would be. You know, I'm not an expert on the internals of the machine itself - you know, the analysers and so on.

Okay. I'll just come back to this aspect of the span gas testing and finding out whether there is a leak. You say, really, what you would rely on is that if it is a much less concentration than was injected into the system, then you know that it has been diluted in some way and that would indicate that the only possibility is a leak, or is that just one possibly?-- That's the only one that I would know of - whether it is a leak in a join or a busted pipe, or whatever.

What steps are taken then?-- You have to try and track it down by going along the pipe and actually bagging the pipe at other areas. There are a series of junction boxes on the way down to the pit. You would either go to one of them, inject a sample again and see whether the reading was correct; otherwise, you would move further inbye.

You try to isolate-----?-- Isolate each area.

-----where the difference is?-- Yes.

Where the difference seems to occur and then examine that more carefully?-- Yes.

What about taking the time that is involved in the sample travelling from the monitor point up to the analysis point?-- The only way we have been doing it is the deputies, the electrician, or whoever is actually injecting the sample notes what time we injected it and he just communicates with a bloke on the screen - on a monitor - find out what time it comes through.

Could the witness see Exhibit 11, please, Your Worship? Just have a look at this, if you would, Mr Robertson. It might be a document that's familiar to you, even if you haven't seen the actual page. Just go to the second page there. You will see a series of columns set out. That's been described as the document that was made up during the span gas testing on 7 August, you see?-- Mmm.

Is that the sort of thing that's made out each time, that is-----?-- This is - yeah, this is a document normally used, but, you know, we had just been going through QA and we were drafting up more precise documents, but this is actually the format it normally is.

There are a few pages before that that seem to be for earlier dates, but they are cut-off on my photocopy, but on each occasion the format is pretty much the same?-- Yes.

The monitor point, the gas reading, the time that it was sent and that would be advised by the deputy that put it in?-- Yes.

The time that it arrived - which would be inserted by the person at the Unor point?-- Yes.

And then the calculation done as to the number of minutes involved. Now, you will see that they are all filled out, although there is no detail inserted for point 18 on that occasion?-- Mmm.

Would you be aware of any particular difficulty with point 18?-- No.

In terms of your general knowledge of the system?-- No.

There was nothing you were aware of that made point 18 different to any of the others?-- No.

You can put that to one side, Mr Robertson. First of all, how long did the whole span gas testing take on any given occasion?-- On any given days, it would average out around about four hours - all depends on transport delays, etc, etc.

I suppose if you wanted to know the time that it took for a sample to go from the monitor point up to the analyser?-- Mmm.

You really had to make sure that that solenoid was open,

because you didn't want your sample to arrive there and then be sent off into the atmosphere; is that so?-- That's correct.

So that something had to be done to ensure that when the sample arrived, this went into the analyser. How was that managed?-- What we used to normally do is group all our sample points in groups of two or three. We'd eliminate all the others from the screen and we would only concentrate on those two or three sample points. As I said, it took approximately a minute to go through each sample point, so we would always inject at least five minutes of gas into the line, so that you always had a guarantee of there being a reading at the computer.

So I suppose in the end result the times that are listed on there would have to be plus or minus a few minutes to take account of that feature?-- That's right, yes.

But taking that into account - or subject to that qualification you would be able to register the time at which it arrived?-- Yes.

But it would still be fed into the one analyser, is that right, which would then send it off in the four directions to the -----?-- Through the one solenoid, yes.

Was there any way that you could keep other points open while you were doing your span gas testing?-- We could.

Other monitor points open?-- We could, yes.

And how would you do that?-- We would just leave it up on the screen, leave it enabled, and whatever monitor point you had enabled on the screen they were the ones that were actually being monitored and would go through the analyser.

So that solenoid would be open the whole time?-- Every cycle.

Every cycle within the five minutes?-- Yes.

On this particular occasion then, 7 August, which is noted on that first page there, was there some attempt to keep open the sampling point that was in behind those seals in the 512 Panel while the span gas testing was going on?-- There was a request made of the electrician by Michael Squires to keep sampling that point, and we left it on the screen virtually all day and, you know, that was complied with which means in actuality that that sampling point would have been getting sampled every three minutes instead of every 13, 14 minutes.

So that then the remaining - you would restrict your testing on the remaining ones?-- Yes.

To probably a fewer number or something; is that right?-- As I said, we'd always leave two or three up on the screen. You know, different areas of the mine there might have been, say, three down in one area and four in another area. You know, you'd normally go to, say, that particular area, you'd work it out with the deputy and electrician, they would work it out between themselves that they would check those three samples points at that particular time. So you would normally keep those two or three sample points up on the screen and go to that one area, do your test and then, you know, when they had arrived, been recorded, they go to another area.

And then they might have two or three in that area?-- Yes.

That would be the subject of testing, but you say that still left room for the 512 -----?-- 512 was left on the screen all the time.

Now, the effect of that was what, that throughout the whole of the span gas testing period that morning 512 was still able to

be analysed on the basis of a sample every three or four or five minutes?-- Every three or four minutes, yes.

So that, in effect, the span gas testing would not have cut across the monitoring of that 512 seal monitor point?-- The seals, no.

I want to ask you about the operation of the alarm system on the Unor room or Maihak system. There was, in respect of each of the gases that were being analysed, provision for a low point alarm?-- Yes.

And then a high point alarm or a low level warning and a high level warning; is that right?-- Yes, there is two levels.

Now, did that mean that, for instance, in the case of methane what you are concerned about is the rise, in your normal situation, the rise in the amount of methane; is that so?-- That's correct, yes.

And you could set the system so that there was an alarm level at, say, two and then another alarm level at, say, three or four?-- Yes.

That sort of thing; is that right?-- That's right.

And if the lower alarm level was breached there would be an alarm, and we will talk in a moment about what you do in the light of that alarm, but it also left a higher alarm level to be breached?-- That's right.

And if that higher alarm level was breached you would get another alarm?-- Another alarm, yes.

And in the system they were really referred to as the gas high 1 alarm and the gas high 2 alarm being the higher alarm, is that right, or is that a phrase that you use, a description that you use?-- Not high 1, high 2. It was just - I was only aware of it as level 1, level 2 alarm.

Level 1, level 2. Now, the gases that were monitored were methane, carbon monoxide, oxygen and carbon dioxide; is that right?-- That's correct.

Now, can you just tell the Inquiry what would happen on the system if an alarm level was breached?-- If there was an alarm, whichever gas it was, the printing on the screen is normally in green, that particular point would flash red and on that system itself it also had a little red square up in the top left-hand side corner. That would flash as well. It would bring a siren up. The siren was controlled by what you probably know as the Con Log panel. Anybody who heard the siren would come around. They could accept it either just by the door going into the room or up on the Con Log panel itself. Accepting that alarm was virtually to turn the siren off. The light on the Con Log panel in the alarm condition would flash. Once the alarm was accepted the light would stay on steady. Then they would have to go to the screen on the computer and they would have to accept the alarm there. After

they accepted the alarm there that point should have - the flashing red light should have turned to blue, just a steady blue, and there should have been a print-out on the printer.

That happened automatically, did it, the print-out on the printer?-- The print-out on the printer, yes, after accepting the alarm.

What would follow after that procedure?-- To get the siren working again they would have to reset the Con Log panel.

How was that done?-- There is a reset button either just beside the doorway going in or there is one on the panel itself. Once you hit that reset button the light would go out and the siren would be activated again. If you received another alarm on the Unor the siren would go off.

In terms of location, that Con Log panel is located on the left after you go into the Unor room from the undermanager's office about six feet inside up on the wall?-- Up on the wall on the left, yes.

The button beside the door as you go into the room is in fact in the undermanager's office?-- Yes.

And it's close to the door that leads into the Unor room?-- It's right beside the door as you walk into the Unor room.

So that in fact you could deactivate the alarm, that is accept the alarm on the Con Log by pressing the button in the undermanager's office without actually going into the Unor room?-- That's correct.

But in that case if you just accepted the - I'll call it the siren to distinguish it from the alarm - if you just accepted the siren by pressing the button at either point in respect of the Con Log the alarm would remain on the Unor screen?-- That's right.

Now, was there only the one Unor screen?-- That's right.

There was no other point, monitor point in respect of that system? When I say "monitor point", computer monitor point?-- No, only the one screen.

And that was in the Unor room?-- Yes.

What would be the consequences of switching the alarm off by de-activating it through the Con Log at one or other of those points but not accepting the alarm on the Unor screen?-- There would be no siren if any other alarms came up at all. The screen should still keep flashing at that particular point plus a little red square on the screen itself. The screen was normally faced out through the window facing towards the starting point, and as I said, you know, you would have no siren alarm.

There would be no siren alarm, the Unor screen would be still flashing?-- Flashing, yes.

Flashing red. Let's take one it step further and have somebody come to the Unor screen and accept the alarm on the screen. What would be the consequences of that? First of all how would they go about accepting it? Let me ask you that first?-- There was a series of buttons along the - there used to be a touch screen, the old system. The new screen was virtually the same. Instead of a touch screen it had to be activated by a mouse.

Was this a new monitor or a new computer?-- New computer system.

With a new monitor?-- Yes.

Do you know what date that was installed?-- That was around about the 27/7 - July, yes.

Okay. Let's talk about the position as it was then with the new computer and the new monitor. It wasn't a touch screen, I take it?-- No, it wasn't a touch screen.

Did it have a mouse attached?-- It had a mouse and it worked the same way. The system was entirely the same way except instead of being a touch screen you just use the mouse to point to whichever square on the screen you wanted. On the bottom left-hand side, furtherest left one, was "accept alarm". It would have been flashing as well. You would have had to activate that button using the mouse which brought up another screen which had a series of numbers, squares from one to nine, and these were supposedly to give recognition or code of whoever was accepting the alarms, but there was never any really instigated, no set numbers for any person, so whatever number was activated it appeared up on another little block on the screen and then you -----

How did you activate that number?-- Just with a mouse, move the mouse up.

You would click -----?-- On whatever number. Whatever number you picked, click the mouse.

There were numbers there from 1 to 9?-- Yes.

Were you limited from 1 to 9 or could you do more than one digit?-- Well, you are allowed two, so you could go to up 99.

So, in effect, you could put in any number between 1 and 99?-- Yes.

Now, just pausing a moment. The purpose of that was that, in effect, there were 99 numbers available to be allotted to people who might be authorised to accept an alarm?-- Yes.

And if numbers had been allotted to people who were so authorised, then assuming that they were strict in using their own number, it would enable you subsequently to isolate or identify the person who accepted the alarm. If Max Robertson had been given number 35 and if you were the only one that ever used that number when you accepted an alarm, then in the print-out and also within the computer system itself it would be recorded that number - what number did I give you, 39?-- 35.

Number 35 accepted the alarm and it would be possible to say, "Well, Max Robertson accepted that alarm, let's go and talk to him and find out what happened."?-- That's how it could have worked, yes.

And that was the only purpose really in having -----?-- That extra screen.

----- the extra screen and the scope to have 99 numbers there?-- That's correct.

But you say that at least at Moura No 2 there were never any numbers allotted to people?-- No, that's right.

So, what happened at Moura No 2 when an alarm was being accepted, what sort of numbers did people use?-- I think whatever - whatever they hit. It could be, as I said, from 1 to 99.

Totally random number?-- That's right, it's very random.

Just to complete this aspect; after the number was entered, what would happen then?-- Whether it was one number or two numbers, they appeared on another part of that screen, and then there was another square on that screen that you clicked to say - I think it said "reset alarm".

Reset alarm?-- Yeah, I'm not too sure, I can't remember offhand.

Now, what would happen to the line on the screen for the monitor point which had alarmed? It was previously, you told us, flashing red?-- Flashing red.

And the alarm is accepted?-- Yeah, you go back to the original screen and that line should have turned to blue.

Turned to blue?-- Yes.

How long does it stay blue?-- Until it - either the alarm clears itself, but if it's in the case of an increasing gas, that will stay blue as it cycles.

If the set point was, say, 2 and that 2 was breached by a reading of 2.2 and that alarm was accepted, the next time the gas sampled, if it was 1.9, or the alarm was accepted, the line goes back to blue - if the next time it was 1.9, that would go back to green?-- It would go back to green, that's right.

If it was 2.2 or 2.3 or even 2.1?-- It would stay blue. It would go back to the alarm condition.

It would stay blue or it would alarm again, if the alarm was reset?-- It would stay blue and it wouldn't go into alarm again until it went through the higher set point.

Until it went through the higher point?-- Higher set point, yes.

So, it would stay blue and that would be it. There would be no more alarms on that point until it went through the higher point?-- Yeah.

That might be an appropriate time, Your Worship.

WARDEN: Thank you, Mr Clair. Would you stay there, witness, we will speak to you shortly? Otherwise, gentlemen, can we resume about 9.15 tomorrow?

THE COURT ADJOURNED AT 4.35 P.M. TILL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 10/02/95

..DAY 23

THE COURT RESUMED AT 9.15 A.M.

FRANCIS MAXWELL ROBERTSON, CONTINUING:

WARDEN: Thank you, witness, you are still on your former oath, you understand that, the one you took yesterday; you understand?-- I understand that.

MR CLAIR: Mr Robertson, we had established yesterday afternoon most of the procedure that occurred in relation to the alarm on the Unor system and the way it interacted with the Con Log system. Now, we reached the point where if the low level alarm had been breached on the Unor system itself, there would be an alarm showing initially flashing red with the flashing red, or the point would turn red, I'm sorry, and then there would be a flashing red rectangle or square up in the corner?-- That's correct.

And the ordinary course of events would be to deactivate the siren by pressing a button at one point or another in respect of the Con Log?-- That's correct.

And then the alarm would be accepted on the Unor screen?-- That's right.

By going through the procedure that you described?-- Yes.

And then that line would turn blue?-- Yes.

Until the next analysis on that monitor point where if the gas level had dropped below the low level alarm point, it would go back to green again?-- That's correct.

If it stayed above the low level alarm point, it would remain blue but there would be no further alarm?-- That's right.

And if the Con Log was not reset, then if the gases increased and proceeded through that high level alarm point, then what would happen would be that there would be an alarm on the Unor screen but there would be no siren?-- That is correct.

Okay. Now, I want to move to the next step in the process; that is, what might occur if the alarm levels were changed. Let's address the lower alarm level. Say it's set at a level of 2 and that's breached and the whole procedure that we have just gone through has occurred except that the Con Log has not been reset?-- I understand, yes.

It's decided - perhaps particularly in the situation where there is a sealed panel being monitored - it's decided in respect of that monitor point then to lift the low level alarm point to, say, 4?-- I understand.

And at some point after that, whether it's the next sampling or an hour or thereabouts later, a sample comes from that

monitor point, is analysed and it breaches that alarm level of 4 with a reading of 5?-- Do you want me to explain the situation?

Yes, I would like to know what happens at that point?-- Well, the line will flash red again, you will get an alarm up on the computer itself, on the Maihak computer, but if the - with the Con Log not being reset, the siren will not go off.

Okay. Well, in that case, of course, the siren doesn't go off, so there is no siren alarm, as it were, to accept on the Con Log. First of all, it's unlikely that anybody would be aware of that breaching of that alarm level unless they actually went and looked at the Unor screen or unless they were sitting there and watching the Unor screen?-- That is correct.

Now, let me ask you this: what about if a high gas level or if a gas level of one of the other monitor points breached an alarm level on the Unor system - say, whether it's a low level or high level alarm or whatever - but assume there was another alarm on another point. No doubt that would cause an alarm on the Unor screen?-- That's right.

But what about the Con Log?-- Still no siren because it hasn't been reset.

And that's because it hasn't been reset in relation to the Unor system?-- That is right, yes.

Now, let's assume, though, that there was some other thing that occurred which tripped an alarm at the Con Log other than the Unor alarm; are you with me?-- Yes.

The Con Log system actually serves a whole series of alarms?-- Yes.

Is it an MH1 or something?-- BM1.

A BM1, I am sorry?-- There is quite a number of alarms there.

Well, let's say a BM1, to take an example. Let's say a BM1 alarm came through to the Con Log. What would happen?-- The siren would go off.

The siren would go off?-- Yes.

So, without the Con Log being reset after a Unor alarm, the only aspect of the Con Log system which is, in effect, deactivated is the Unor?-- Is the Unor itself.

Okay. Now, I want to come to the position as it exists when a sealing of a panel has just taken place and when it's anticipated that there will be a series of gas levels being breached, gas alarm levels being breached?-- Yes.

Is there a set procedure in place to deal with that?-- There is no written procedure at all, but what would happen would be

to - as the levels rose - as the gas reading rose through each level, the alarm would be reset, and once it passed through those levels you would put - increase the levels slightly just to keep in front of it so that the computer would keep alarming.

Was there any practice of actually increasing the alarm level before the alarm occurred?-- Not that I am aware of.

With each of those steps?-- Not that I am aware of. It should have gone through the - at least the low level alarm before any changes were made to the set points.

So, there should be an alarm and then it would be raised, the level would be raised?-- Yes.

Ordinarily it would be the low level because that would be the first one breached?-- That is right.

That would be raised, and then there should be another alarm when that's breached again?-- That is right.

And then it would be raised again. So, every alarm should register?-- The only time I had anything to do with it - I used to just keep it just in front of the rising gas so that, you know - it all depends on the trend of the gas, how quick it was rising, etc, etc. You might increase the alarm level by, you know - for CO, say, 10 parts or whatever.

You keep it just in front, but when you say that, you mean that you would wait for the alarm -----?-- Wait for the alarm to come through and then adjust it so it will go through the alarm again.

But you wouldn't adjust it by any enormous amount is what you are saying?-- No.

So that, in effect, you were being warned every time that it went up to the -----?-- There was a rise, yes.

----- newly set level. I suppose with oxygen we are talking about a different direction?-- The decrease of it.

You would be decreasing the alarm level?-- Yes.

Now, was there any special arrangement whereby only certain people had the authority to set these alarm levels?-- Not to my knowledge.

So, anybody who could operate the system could change the alarm level?-- Anybody who knew how to operate the system had access to it.

Never any protocol established?-- Not that I was aware of.

Even informally?-- Usually only undermanagers or, you know, electricians used to do it at the request of the undermanagers. I am not aware of how much knowledge that the deputies had of it.

But there was nothing by way of a protocol or even an informal arrangement to prevent a deputy from changing the alarm level if he had the requisite knowledge?-- Not that I'm aware of.

Well now, was there any established protocol whereby people operating the system were directed that when an alarm had been accepted on the Unor, that the Con Log should be reset so that there would be a siren on the next alarm point?-- I can only speak on behalf of myself and the electricians, and we used to always accept the alarm and reset the Con Log after we reset the screen.

And reset the Con Log, and that - as far as you were concerned -----?-- As far as I'm aware, yes.

----- that was always the procedure you followed?-- Yes.

And I suppose you would say that was the appropriate procedure for the reason that I was pointing out before: if you didn't reset the alarm, then it would possibly be just good fortune that it might be discovered that an alarm level had been breached?-- Well, it would rely on people actually looking at the screen to see the flashing red.

And if people were busy - I mean, ordinarily there wasn't just somebody sitting there watching the screen all the time, was there?-- No, there was no-one there full-time.

And that would mean that even if it was during a period just after the sealing of a panel when one might expect alarms, it would mean that even if an alarm level was breached in respect of some monitor point totally unrelated to the sealed area, that if the Con Log hadn't been reset, the alarm wouldn't go off?-- That's correct.

For instance, if 5 South was operating after 512 had been sealed and the Con Log hadn't been reset for alarms, there could be a methane alarm at 5 South that could activate the Unor system, but if the Con Log hadn't been reset there would be no siren?-- That's correct.

Nothing to tell anybody about it?-- No. As I said, the only thing visual was the screen flashing.

Now, I want you to have a look at a document. Exhibit 127, please, Your Worship. Just while that is being obtained, was there ever any discussion at - or did you attend safety meetings?-- I attended some of them, yes.

I suppose in particular you would have been at those meetings that dealt with things like the Unor system because that was your area of operation?-- If there were any subjects brought up about the Unor, I was notified.

Were you ever asked to have input on what might be established as a system for dealing with alarms, a formal system?-- No.

I know you say there was none set up, but was there ever any

suggestion that there might be?-- Not that I can recall.

Was there ever any suggestion at any of these meetings that numbers, or that, first of all, the people who might access the Unor system with a view to either accepting alarms or resetting alarm levels, or both, might be restricted to a certain group?-- Not that I recall.

Never any suggestion at any meetings that these identification numbers or authority numbers might be assigned to people to use when they were accepting an alarm so that subsequently the person who accepted the alarm could be identified? Any discussion of that at any time?-- Not that I can remember.

You were there when the system was installed?-- Yes.

And you were there when the new computer was installed late July, I think it was?-- I was tied up somewhere else when the computer itself went in.

That's the new computer?-- Yes, the new system.

You see, I am just interested in how things developed in relation to the Unor system. There seems to be some suggestion that it really developed a bit like topsy; there was never any crunch point where everybody sat down and said, "Look, this is the way we are going to run it and really set it up as a system." Would that be fair comment?-- That would be correct, yes.

The question of establishing it as a system that worked with some real rationale behind it was one which was never really addressed by management; is that so?-- I cannot answer -----

As far as you knew?-- As far as I know, but I can't answer for the management because, you know, they might have had their own discussions but we might not have been part of it.

There was never any suggestion to you about those things I mentioned to you?-- Not at all, no.

You have got that technicolour document in front of you there, Exhibit 127, and what I want to do, really, is just to fairly quickly work from the top of the document, because you will see that that record commences on 27 July, which I think is the date which you mentioned yesterday as when the new computer was installed, to the best of your recollection?-- That's correct.

Just briefly, if you look across - well, look across the columns in the document you will see what each of the columns relates to. You don't have any confusion about those columns there - what they men?-- No.

The first batch, if I can call it that, of alarms that are recorded there on 27 July - and in respect of a number of those, in fact, the set point values appear to be zero, and they would seem to be associated with the installation and setting up of the system on the new computer?-- I would assume that, yes.

The authority number there is just a 77, and one can accept one is put in as 58 - the last one is 58. There doesn't seem to be any particular system or rationale that works there?-- No.

The next batch, if I can call it that - the next batch of 5 alarms there all relate to monitor point 16. Do you remember where that was - monitor point 16? It has got "512 top return"; is that right?-- That would have been right, yes.

Did you have knowledge actually underground as to where that was?-- Approximately.

And a brief description? Was it outbye of the sealed site in the top return - around the corner from the sealed site as you recall it?-- That's on the 2nd of the 8th. I couldn't be quite sure, actually.

You don't remember on the 2nd of the 8th just where it was?-- No.

But, anyway, it is the 512 top return point. The first of those shows that on 2 August there was a breach of the carbon monoxide alarm with a reading of 7.17, breaching a set point value of 7?-- Yes.

Now, first of all, do you have any personal memory of this series of alarms in that top return?-- No.

You don't have any personal memory of it. Did you have any input in setting that set point value of 7 - it appears to be 7 ppm?-- No.

The next day on 3 August shows an alarm. At this stage the set point value had been raised to 8. Do you see that over in the set point value?-- Yes.

And it was breached with an alarm value of 8.8?-- Yes, I see that, yes.

In that alarm type, you will see the description there, "gas high 1". I think you indicated yesterday that wasn't a term you used yourself?-- It possibly is, yes. I might have been mistaken.

The gas high 1 is, in fact, the low level; is that right - gas high 2 is the higher level?-- Yes.

So, in each case here, it is the low level of alarm that's being breached; is that right?-- Yes.

The next one shown there is on 5 August. That was the Friday, still at point 16 in the 512 top return and at that stage the set point value was still 8?-- Yes.

And it was breached with a reading of 8.03?-- Yes.

The next one is 6 August, about 10 to 8 in the morning, a set point value of 8, and it was breached with a reading of 8.33; is that right?-- Yes.

And the next one is 6 August and this is at about 20 past 8 in the evening, the same point, and by this time the set point value has been raised to 10?-- Yes.

And it was breached with a reading of 10.3?-- Yes.

From other evidence we know that by that time the sealing process was underway at 20 past 8 in the evening?-- Yes.

Did you have any association with resetting the set point values at that stage?-- No.

Were you at the mine that night?-- No.

The next day?-- No - that's on the Saturday, isn't it?

The 6th is the Saturday, the 7th is the day-----?-- I was there for a few hours on the Saturday morning and I didn't attend the mine until after the explosion.

On the Saturday morning, did you have anything to do with the Unor system?-- No.

The next batch, if I can call it that, being the next six, are all alarms at monitor point 5 which was then the point behind the 512 seals; is that so?-- Yes.

Now, you will see there that the first of those is an alarm which occurred at about 16 minutes past 11 on the Saturday night, 6 August. Obviously by this time at least the monitor point had been put behind the 512 seals, even if the seals weren't finished?-- Yes.

You will see that that's a breach of carbon monoxide alarm,

the low level, which at that stage was set at 5 and breached with a reading of 5.33?-- Yes.

The next line is again a carbon monoxide alarm, the low level alarm, which occurred at about 8 minutes past midnight and at that stage you will see that the set point value which is shown is 10, so that at some time after that 16 minutes past 11 alarm, the set point value was raised from 5 to 10 for the carbon monoxide low level-----?-- Yes, I see that, yes.

Would that be consistent with the sort of thing you described earlier - raising it from 5 to 10?-- Yes.

And then you will see the next one is again a CO alarm of the gas high 1 - that's the low level alarm, which was at 5.44 in the morning, and at that stage the set point level had been raised to 45?-- An extreme jump.

I was going to ask you, would that be a leap one would take all in one step, or would that be perhaps a leap you would ordinarily take in a few steps, from 10 to 45?-- Myself I would take a few steps, but in this situation I don't know who was doing it and how quick the gas was rising. They might have been monitoring it all the time.

If somebody was monitoring all the time, sitting there watching, it would be feasible, would it not, if you can comment on this, to actually raise the alarm level initially from 10 to 20, say, and as the gas level was approaching 20, and before - or without waiting until the alarm went off, then raise it from 20 to 30?-- If he was sitting there watching it all the time you could do that, yes.

Then from 30 to 45, say?-- Yes.

So, it may be that it wasn't that it just jumped up in one step from 10 to 45, but rather jumped up in a few steps but anticipating the alarm in each case?-- Yes, he could have done that, yes.

As far as the operation of the system is concerned, there is nothing to prevent that being done?-- No, that's right.

Then the next two alarms there are in respect of the methane levels at that same monitor point - monitor point 5. The first of those is at 5.44 in the morning again where the set point value was 1.7?-- Yes.

The next one was at 7.15 when the set point value had been raised to 2?-- Yes.

And then the next alarm there is a breach of the CO at low level at 8.25 by which time the set point value had been raised to 60?-- Yes.

That completes that batch of 6 - a series of six alarms at the 512 seals. You will then see that there is a set of alarms which respectively relate to monitor point 19, 3, 4, 8, 9 and 1. Do you see those?-- Yes.

They range between the times of 8.48 through to 9.40?-- Yes, I see those, yes.

They are all CO alarms. Would it be - what you see there and have seen there when you looked at it previously, would those be consistent with alarms going off during the span gas testing procedure?-- Yes.

At those points?-- Yes.

Then you will see one in respect of the 512 seals, being a breach of the CH4 at 9.49?-- Yes.

The set point value at that point being 2.5?-- Yes.

So, it had been raised from 2, back at 7.15, up to 2.5 at that time?-- Yes.

That would be the normal sort of step; is that so?-- Yes, it should be, yes.

Nothing unusual about raising it from 2 to 2.5 in one go?-- No.

Then the next two points actually relate to monitor point 18. I think I asked you yesterday whether you were aware of any unusual aspect of monitor point 18?-- I wasn't at that stage, no.

You said you weren't. You will see that one of those is at 10.04 and the next one is at 10.47 and, in fact, they are breaches of the gas high 2 alarm and the gas high 2 alarm - the set point value for that at monitor point 18 was 2 in each case; is that right?-- Yes.

You don't have any particular knowledge as to what might have caused that?-- No.

Ordinarily with the span gas testing, you might expect one at least alarm?-- Well, on that day they were injecting CO, so that shouldn't have anything to do with the CH4.

So, the CH4 couldn't cause that, and these are both CH4 alarms. Tell me this: if you have got gas high 1 and gas high 2 and the amount of gas breaches not only 1 but 2, where do you get your alarm? On gas high 2?-- I would assume so, yes.

If you look at all those span gas testing ones above that, you will see all of those breaches are breaches of the higher alarm?-- Higher alarm, yes.

Without any record of the breach of the lower alarm level?-- Yes.

So that would seem to be the case that-----?-- You go straight past level 2.

Breaches gas high level 2?-- Yes.

Just putting aside those unexplained point 18 ones, the next one is a breach at monitor point 5, the 512 seals, being a breach of the CO level at 11.26, and the set point value at that stage is 80?-- Yes.

Having been put up after the alarm at 8.25 at 60?-- Yes.

The jump from 60 to 80?-- The only way I can explain that is that it was being monitored all the time and they may have kept in front of it.

Ordinarily you wouldn't take a jump from 60 to 80 at one time - in one leap - you wouldn't if you were doing it?-- Not if, you know, the gas was rising steady. It all depends on the rate of rise. You know, I wouldn't normally do it, no.

The next two alarms are again point 18 and again they are methane alarms. The breach of the gas high 2, that's the higher level in each case, and the set point value is still at 2, so there had been no change in the set point value on 18?-- Yes.

Did anybody ever say to you that there had been a series of methane alarms at that point 18?-- No.

That morning?-- No.

Of course, if because of the situation with the 512 sealing, if the alarm - if the Con Log had not been reset so that the siren went off, that is because somebody was there and perhaps monitoring the increased levels in respect of monitor point 5 or increasing levels in respect of monitor point 5, or even if somebody wasn't at the computer but if they were expecting that there would be continual alarms resulting from monitor point 5, if in those circumstances the Con Log hadn't been reset the siren wouldn't go off with these methane alarms at point 18, would it?-- If the Con Log hadn't been reset, that's right.

The next two alarms I'm talking about, the one - 12.24 and 12.26, one is at point 6 and one is at point 16 and they are CO ones on gas high 2, and they would appear to be consistent with further points coming in on the span gas testing; is that right?-- Yes, yes.

Because 6 and 16 aren't mentioned in the first batch up above?-- No.

And then the next point is again a methane alarm, gas high 2 level being breached at monitor point 18 with a reading of 4.36 against a set point value of 2?-- I see that, yes.

That seems to fit the pattern of the earlier four alarms at point 18?-- Yes, by the look of it, yes.

The next one is monitor point 7 with a CO alarm going through gas high 2 with a pretty high level of CO, and that again would appear to be consistent with the last of the span gas results coming through; is that right?-- Yes.

Or at least putting aside 18, the last of the span gas results, because again 7 hasn't been mentioned up above?-- No, that would be the last test.

And then the next one is an alarm on methane at the 512 seals?-- Yes.

By this time the set point value has been raised to 3?-- Yes.

From 2.5?-- Yes.

That wouldn't be an unusual level or jump, from 2.5 to 3?-- No.

The next one is oxygen at the 512 seals going down; is that right?-- That's right, yes.

The next one is again methane at the 512 seals, this time - this is at 23 past midnight on the eighth and that breaches a level of 4.5; is that right?-- That's right, yes.

Sorry -----?-- 2015.

I'm looking at the wrong one. It was accepted at 23 past midnight. It was quarter past eight in the evening, I should say, and the level had been by that stage moved to 4.5, the

set point level?-- Yes.

So that as far as you can see there, between about - well, between 12.47 that day and quarter past eight that night the level had been moved from 3 to 4.5 on the methane?-- Yes, that would be reasonable.

That would be reasonable?-- Yes.

Then the next one you will see there is in fact a CO reading at point 18 which was registered at nine minutes past 10 that night and it breached gas high 2 with a reading of 23.77 against a set point value of 10. Do you see that?-- I see that, yes.

I mean, on the one hand, if that had been much earlier in the day from what you know about spas gas testing being done much earlier in the day -----?-- I would have assumed that was part of the testing.

Because point 18 is the only one that hasn't so far shown up out of the span gas testing, but that's an extraordinarily long time for that sample to take to get through there, isn't that right, assuming it was put in during the morning?-- Yes. I would say it had nothing to do with the sample. It was put in.

Just something else?-- Yes.

But it's a gas high breach of the CO level?-- Yes.

The next is a breach of CO at the 512 seals at 28 minutes past 10 that night?-- Yes.

The Sunday night, and that shows a breach of a set point level of 150?-- Yes.

Now, that seems to have increased from 80 going back to that alarm at 11.26 that morning?-- Yes.

Through to 150?-- Yes.

Would that be likely to be done in one jump or would that be a series of jumps?-- I can only assume -----

If you were doing it yourself?-- If I was doing it, you know, that time frame - I wouldn't jump from 80 to 150 unless I was actually monitoring it all the time and keeping just in front of it.

You say you wouldn't?-- I wouldn't jump from 80 to 150, no, in one hit.

You would go from 80 to 90 or -----?-- You would have to be sitting at the screen there and keeping an eye on it all the time.

And watching it and pushing it up?-- Yes.

In the absence of someone sitting there doing it all the time it would seem that the level has jumped from 80 to 150?-- Well, if nobody was at the screen itself between those times it would seem -----

The next one is a reading of methane at the 512 seals at five to 11 that night and that's a breach of the gas high 2 alarm; is that right?-- Yes.

On methane, and that gas high 2 level was set at 8 by the looks?-- Yes.

So it seems that nothing had been done in respect of the gas high 1 alarm after the alarm at quarter past eight and the gas has continued to rise and has gone up through the gas high 2?-- Yes.

Would that ordinarily be the situation which you would expect, nothing that had been done on the gas high 1 alarm? I mean by rights, if everything was in place when the gas high 1 alarm went off at -----?-- Quarter past eight.

At quarter past eight, then you would expect that there would be a siren blaring and all the rest and that something would be done to accept it, something would be done about shifting the level?-- That's right, yes. You would imagine that, yes.

But here there doesn't seem to have been anything done, at least to the gas high 1 level, and you get a breach of the gas high 2 -----?-- That's right.

----- in the course of the night. Okay. I just want to ask you whether you are aware of what is meant by the corrected value, because you will see that on that line there is an alarm value of 10.65 and then there is a corrected value of 5. Do you know what that means?-- No.

We can take that up with those that prepared the table. All the rest of the page from that alarm at 23.40 on, they all seem to be alarms that occurred all within a few minutes?-- Yes.

And they would all seem to be alarms that resulted at the time of the first explosion from what we know?-- Yes.

You will see that they are all accepted, some considerable time later at 23 minutes past midnight?-- Yes.

And occurred at about 11.40 and accepted, 23 minutes past midnight. Let me ask you this: you will see in respect of all of those, and also in relation to a few of the others, but in respect of all of those the authority number is in there as 1?-- Yes.

Now, there has been some evidence that the power actually went off at some stage after the first explosion and then came back on again. If the power went off what would happen in relation to the Unor system? Is there an emergency power supply that comes in?-- We do have an emergency generator there, yes.

Would your system then continue to register the alarms?-- It would. All the - by the look of this all - the whole screen, every line would have been flashing red after the explosion, yes.

And even if the power cut off and came back on the Unor screen would retain that alarm mode?-- Yes.

Is there any system whereby - if that occurred, of course, then there would have to be an acceptance of those alarms on the screen at some point?-- Yes.

There is no system whereby if the whole thing is switched off there is a default to 1 on this authority number?-- Not that I'm aware of it.

So it would seem that somebody has actually taken the step of accepting all those alarms and they have used the number 1?-- Used the number 1 and that would be the number that came out on every print-out.

The other authority numbers down that page on that final column are just a random set of numbers it would appear; is that so?-- Yes.

Would it be feasible in respect of the Con Log, because - let me put this situation to you first of all: there is some evidence of at least one person being in the crib room at a time when these alarms were coming through and he says that he certainly didn't hear any siren and the siren is the sort of thing that he wouldn't have missed if it had gone off?-- Yes.

So it does seem that at least in respect of a number of these alarms that there was no siren activated?-- It sounds that way, yes.

From the point of view of the electrician who knows the system, would it be feasible to have a time delay situation whereby if the Con Log is not reset that there is an automatic resetting of the Con Log?-- Not with the way it was set up at that stage.

Would it be feasible in the future to have that sort of thing?-- Yes.

In effect the whole alarm system in so far as it depends on the siren to attract peoples attention to an alarm is dependent on some human activity?-- That's right.

That is going back over there and resetting the Con Log?-- That's correct.

That's right, isn't it?-- Yes.

And there would be ways to overcome that?-- Yes.

If you had the right system?-- Yes.

There is some reference in the questions that were asked of you and recorded in your statement to whether you were aware - or whether you knew if the general practice of alarm control for sealing panels was put in place for 512 sealing. It's not really clear from your answer whether in fact you were aware of any general practice of alarm control for sealing panels but was there one, a general practice of alarm control?-- I think what they were referring to there was the adjustment of the set points et cetera.

Right?-- To get the alarms working as the gas rose.

There wasn't any laid down procedure for it?-- No.

Along the lines, for instance, that you've said, that is that you should wait for the alarm and then reset?-- There is nothing written down or anything.

You can put that to one side. On an unrelated matter, did you have any association with the operation of the gas chromatograph -----?-- Yes.

----- that was kept there?-- Yes.

What was the extent of your association?-- Virtually the same as with the Maihak system. I was there to keep it running, make sure it worked properly. If you want me to elaborate, when the system was originally put in in approximately December 1990 there were a few of us put through the workings of it.

How many of you?-- At that stage there was meself, another undermanager, Bruce Danvers who has since left, and from what I can recall it might have been a couple of electricians and other undermanagers. They just came in and went out sort of thing and got a brief runover of the system, and since Bruce Danvers has left I've virtually assumed the role again of looking after it.

With that system there is some regular testing conducted, is that right?-- That's right.

To check its accuracy?-- The main thing we used to do was do calibration checks on it and it's hooked up by - through a computer via modem down to SIMTARS in Brisbane and we used to check the - be able to send the results and calibration checks down to SIMTARS, they could look at them, just check them out, see if they were working all right and advise us.

That was twice a week that it was sent to SIMTARS; is that right? Mondays and Fridays?-- Probably more regular - that system over the last six months would have been probably correct, yes, before the explosion.

That's six months before the explosion. So you did the checks how often? Every day or -----?-- Every day, yes.

And -----?-- Except for weekends.

And those two days a week, Monday and Friday?-- We used to send the results through to SIMTARS to test that system out, make sure we could send one down, they could check them out and retrieve them, just to go through the whole process.

There was a specific gas that you used to test the accuracy of

the system?-- There was a calibration gas, yes.

Now, you were helped in that work by Ken Selff?-- Yes.

So, he had a close association at least over the recent time -----?-- Over the recent time, yes.

----- to the explosion. He had a close association with it, but did anybody else have an ongoing association with it apart from you and Ken Selff?-- A few of the electricians. I trained them up actually before I trained Ken.

The other people who initially learnt something about it, was there anything done to keep them up to scratch on it?-- No. Well, as I said, one left and I was the bunny.

Okay. So, even some of those then that learned initially and stayed on, they really - anything they learned they probably forgot because they didn't -----?-- It's hands-on experience, you have got to be using it all the time.

No further questions. Thank you, Mr Robertson.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Robertson, I want to ask you some questions about the span gas testing of the system?-- Yes.

I think you told us that that was done approximately once a month?-- The tube bundles, yes.

And that was done to make sure that the tube bundle system was operating correctly and producing accurate results?-- Yes.

If a fault was found in the tube bundle system, action would be taken to locate the fault?-- Yes.

And what would that involve? You would go underground, would you?-- You would have to go underground and go back through the particular line itself and inject the sample in a series of J boxes we had along the line to try and isolate where the fault was.

Then would the system be re-tested to see whether the fault had been corrected?-- We would put a sample back in at the original sample point, yes.

And one of the difficulties sometimes encountered was a tube may be leaking?-- Yes.

So that the sample -----?-- Was diluted.

----- was diluted or less than the required concentration of gas?-- Yes.

And that would require checking and rectification?-- Yes.

Were there certain people only who were authorised or trained to do the span gas testing process?-- The majority of the electricians and deputies, as far as I am aware, knew the set-up.

And were familiar with what was required?-- That's right, yes.

Was there any documentation in place as to how that process was to be done?-- Rectifying a fault or just the actual testing itself?

Doing the test and then what action should be taken?-- There was no written documentation, no. It was just knowledge, you know.

Was there a procedure for recording the results of the span gas tests?-- Only on the sheets that we had that are available as the exhibit, but we were going through the process of QA and we were drawing up new sheets, etc, etc.

So, when you say "QA" you mean Quality Assurance?-- Quality Assurance, yes.

And that was in the process of being introduced but hadn't become fully operational with respect to the Unor system -----?-- No.

----- and the testing of it at the time we are talking about?-- No, that's right.

But efforts were being made to bring it under the QA system. Now, could I just show you Exhibit 11, please? You have seen this when Mr Clair was asking you questions. I think you have identified that as being the sheets where the span gas test results were recorded?-- Yes.

Could I ask you - there is a bundle of sheets there. The first sheet behind the cover sheet seems to refer to the testing done in relation to carbon monoxide on 7 August?-- Yes.

That is the day of the explosion?-- Yes.

The next sheet back doesn't seem to have a date but I can read it. It seems to be blocked out on my copy and I think the copy of the exhibit?-- Yes.

But it also seems to relate to CO readings; is that so?-- Yes.

Now, looking at the format of that, would that relate to a different span gas test date?-- Yes, it would.

Because you wouldn't have two sheets like that?-- No, this would be approximately a month before.

A month before approximately. If you take one further sheet back, it seems to relate - it's not dated again - a similar sample of monitor points but referring to methane?-- Yes.

Would that be a different date again?-- That would be, yes.

So, you wouldn't test methane and carbon monoxide on the same date?-- No, we had a choice of either methane or carbon monoxide to put into the sample lines.

Which ones you used would just depend -----?-- On the day.

----- on your preference on the day?-- Yes.

The object being to introduce a known concentration and test the concentration at the other end to see whether the tube was intact?-- That's correct.

The next page back, what would that relate to, concentrations around 29 to 32? Does that ring a bell or -----?-- That would be methane - sorry, not methane, carbon monoxide.

The other one seems to have concentrations of about 44 ppm that were produced?-- It all depends what the sample bottle had in it.

Sample bottles differed from -----?-- Yes.

But always were marked as what the known concentration was?-- Yes.

So, you think 29 to 32 would be CO?-- Yes.

Then there is the last sheet which does have a date on, it's the 9th - it looks to me like 9 July '94, top left-hand corner?-- Yes, yes.

And it refers to the CO, and again it seems to be a concentration, known concentration, of 44 ppm?-- Yes.

Now, that last sheet which apparently relates to 9 July has a different format, although it's similar in design to the other sheets, but the last sheets seems to be a proforma sheet, doesn't it?-- Going by the number down at the bottom left-hand corner, this is part of the QA.

That's a QA number?-- Yes.

FD740018?-- Yes.

That's 9 July?-- Yes.

The sheets in front of that are undated except for the first one which is 7 August?-- Yes.

The 7 August one obviously follows the 9 July one but isn't on QA form?-- Mmm.

Does that help you say anything more about the QA system so far as applied to the testing of the Unor monitoring system? There must have been in existence in July QA forms such as the one that appears here?-- Yes.

But they don't appear to have been -----?-- Carried on into August.

Although the format is the same, the columns are the same, the information recorded is the same?-- Yes.

But the QA form itself doesn't seem to have been used?-- Whether the electrician on the day didn't realise the form was there or couldn't find it, just drew his own up.

In any event, the QA system was coming in and was to cover this eventually?-- Yes.

Given the QA form, which is the last sheet, was 9 July and the top one is 7 August, roughly about a month apart, what dates would the ones in between be? Would they be in between those two dates or before 9 July, or is it not possible to say?-- I would say they would refer further back.

Further back, so that you think it was about once a month the test was carried out?-- Approximately once a month we were starting to schedule them.

9 July, the next one would be 7 August probably?-- Yes.

And the other ones may have been before that?-- Yes.

Now, I want to take you then to some information contained on those sheets. If you take the 9 July sheet first, that's the last one in the bundle. If we accept that the concentration from those figures - a known concentration of 44 ppm is the concentration introduced?-- Yes.

Do you see there seems to be some problems with some points?-- A couple of points were reading low, yes.

The first of those seems to be point 19?-- Yes.

Which is reading?-- 29.

29 ppm?-- Yes.

As opposed to 44?-- Yes.

And point 8 is reading 26 ppm as opposed to 44?-- Yes.

Now, the sheet seems to record that the test was redone for 19 and 8. You see further down the line, it's got "19 x 2", "8 x 2"?-- Yes.

Would that indicate re-testing of those two points?-- Yes.

By introducing another known sample of 44 ppm?-- Yes.

Again, 19 seems to have come up to scratch by reading 43?-- Yes.

But 8 is still deficient reading 34?-- Yes.

Now, that would indicate again by a second test, there seems to be some problem with point 8?-- Yes.

Could be leakage?-- Could be, yes.

Or it could be any number of things?-- Yes.

Having conducted the second test, you were placed on notice that there is still a problem?-- Yes.

And ideally you would be looking for the reason for that?-- Yes.

Now, it's difficult to say because we don't know the dates of the centre pages here, so if you go to the 7 August reading, Sunday, the day of the incident, which was the next span gas test in time?-- Yes.

You see point 8?-- Yes.

Again appears to be reading low?-- Yes.

Sorry, this is 7 August?-- Yes.

That's the front sheet?-- Yes.

That seems to be the next test that was carried out on this system?-- Yes.

The next month. Point 8 is reading 29 again; is that so?-- Yes.

So, there still seems to be a problem with point 8?-- Yes.

It wasn't tested again on the 7th, there is no record of it being re-tested on the 7th?-- No.

As it had been on 9 July?-- No.

Were you involved with - you weren't involved with the testing on the 7th?-- No.

Or the 9th, or you can't remember?-- No, as I said, it was done by the deputies and the electricians.

But in the ordinary course, you would expect that something should have been done?-- That problem should have been rectified.

About point 8?-- Yes.

Because again, any particular point that is not reading correctly can provide faults, erroneous information on the analyser?-- Yes.

You don't know, therefore, what a particular part of the mine - what the atmosphere is doing in a particular part of the mine?-- That's right.

Now, if we can again go back to the 9 July test. I am sorry, before I do that, can I just take you to those middle sheets, and by way of identifying the page, it's the page immediately following the top page of 7 August, so three pages in from the exhibit counting the front sheet?-- Yes.

Again, just for completeness, you see point 8 is 26 and that refers to apparently a known concentration to be assumed of 44 ppm CO?-- Yes.

So, point 8 is reading low again?-- Yes.

It's re-tested on the same day - you see down the column 8 equals 2 or No 2?-- Yes.

You get a reading of 34?-- Yes.

Which again is low?-- Yes.

So, you have got a similar test procedure where on two occasions point 8 in a span gas test system is found to be reading incorrectly?-- Yes.

And no evidence of any action taken to correct it?-----

MR MORRISON: Excuse me. So we don't prolong the time, and really not by way of objection, by way of assistance, I think if you compare the sheet we are looking - I will start again, I beg your pardon. I am interrupting not to object but to try and assist. I think if Mr MacSporran and the rest of us compare the sheet he is referring to, that is the third physical sheet, with the QA form for 9 July, you will find the information is identical, which might lead to a different line of questioning than to suggest there were two occasions of this appearing.

MR MACSPORRAN: All right. The QA sheet is 9 July, that's the last sheet?-- Yes.

The sheet I am showing you?-- Would be 9 July too.

The sheet I am showing you, does it have a date at the top that you can see?-- Not on this one here, but I would say it was 9 July, going by the readings.

Well, have a look at this copy. That is dated the 8th. I'm not sure where that came from but that's got 8 July on it?-- Mmm.

The information -----?-- On the QA one -----

----- is identical to that?-- Whether they wrote it out on the - transferred it over on the 9th and got the wrong date, yes.

In any event, the testing of point 8 on that occasion showed a low reading on each occasion, each test?-- Yes.

Could I have that one back, please, the 8 July one? The next page in, which again doesn't have a date on my page - sorry, two pages in is back to the carbon monoxide readings, is that so, the 30's?-- Yes.

And in respect of that you have what looks to be point 8 at 29. It's hard to see. I think it's above that punched hole in the page, above point 6?-- Yeah, between 3 and 6, yes.

Well, 29 as opposed to those 30's readings, that would be roughly within a standard deviation?-- I would say that would be reasonable, yes.

Now, does that give the appearance at least that point 8 was found to be in error and doesn't seem to have been rectified as at 7 August?-- It's either that or it's been rectified and it's gone faulty again.

And you simply can't assist us with what action, if any, may have been taken in respect of point 8?-- I can't recall that.

Because as far as you know, you had no personal involvement -----?-- No, not on those dates, no.

Can I take you back to the 9 July one, the last sheet again? Points 16 and 5 were reading what is apparently the correct concentration of CO; is that so?-- Yes.

And the lag times with respect to 16 and 5 were 69 and 45 minutes respectively?-- Yes.

Does that seem to be a problem? Accept that 16 was the 512 top return and 5 was the - I think the North-western return of 512 - 512 bottom return initially before it was moved?-- Should be, yes.

They were very close together, those points?-- Yes.

And you would expect the lag time to be very similar?-- To be consistent, yes.

And that shows some inconsistency, the lag times of those two points on that page?-- Yes.

If you go to the 7 August test, we see the same trend, don't we? I think at that stage those points had been moved but they were still reasonably close together in the scheme of things?-- Yes.

So, you had point 16 with a 73 minute lag time and point 5 with a 44 minute lag time?-- Yes.

The point 5 lag time seems to be about right?-- Reasonable, yes.

The point 16 lag time was -----?-- A bit long.

----- a bit long?-- Yes.

What investigation would normally be carried out to investigate a lag time like that?-- You would have to try and find out whether the line had been pinched somewhere or other, some sort of a flow restriction.

And that would be a physical examination underground?-- Yes.

Because the bundle system was visible -----?-- The bundle system, plus there was single lines down there as well.

Again, the next sheet in, whatever date that is - I think it's the one that's the identical one to the last sheet - 16 and 5 are 69 and 45. That's the same as the 9 July one?-- Yes.

On the next sheet in, which is the methane testing, 16 is 70 minutes and 5 isn't tested apparently; is that right?-- Yeah. I'm not too sure what happened there, no.

And the next sheet doesn't have 5 on it either as far as the sheet indicates. Now, again, you have been taken to point 18 for 7 August, and whilst you didn't think point 18 had a problem, it's apparent that the sampling introduced as part of the span gas testing just didn't arrive at the surface in the few hours after it had been introduced?-- That's right.

So, that again is some problem -----?-- With point 18.

----- with point 18?-- Yes.

In any event, as far as you know, there was a system being put into place to deal with these sorts of problems and to document it by way of Quality Assurance?-- Yes.

But hadn't yet become fully operational as at 7 August?-- No.

And obviously it's a step in the right direction to document all of these things and have steps taken to correct anything that arises?-- That's right, yes.

I think that point 18, which is verified by the alarm log you were taken to, shows something coming into point 18 about 10 hours after the sample was introduced?-- Yes.

And the alarm goes off accordingly?-- Yes. It seems strange that there was - any reading came up that late after that length of time.

It's just an indication perhaps there is something drastically wrong with 18?-- Possibly.

You have spoken about the system which had number codes for people to introduce to accept alarms?-- Yes.

The idea of that, no doubt, being to identify the person who accepted the alarm?-- That would be right.

And that would enable any investigator after an incident to identify the person and speak with them as to what they did, what they observed, and what was going on at the time?-- Yes, that's right.

If the system is not adopted by way of a person being allocated a number and numbers being used at random, it is obvious that there is no way of tracing who accepted a particular alarm?-- That's correct.

And the alarm log demonstrates very clearly that a lot of the alarms are accepted by a person using the number 1?-- It may have been the easiest one to get to.

But it doesn't help identify the person who used it?-- No.

Unless that person presents themselves as the alarm acceptor?-- Culprit.

The gas chromatograph you have spoken off - and you said how the CAM gas system was briefly checked by using the facilities at SIMTARS?-- Yes.

On this occasion there was no bag sample or any sample taken to put through the gas chromatograph after sealing, was there?-- Not that I'm aware of, no.

It is a procedure that could have been done?-- It could have been done, yes.

Do you know of any other occasion when a panel has been sealed when that has been done to take a sample for use through the gas chromatograph?-- I can't recall any. That's not to say that that wasn't done, but-----

No. Do you think, given your connection or your experience with the gas chromatograph and knowledge of it, you would have known had it been done?-- If I wasn't told - you know if it happened on a back shift or something like that - as I said, some of the electricians didn't know how to use it.

Just finally, with the span gas testing being done on a regular basis, as it was, you expect to have alarms going off during the course of introduction of samples into the lines?-- Yes.

That's reflected in the alarm log which is Exhibit 90; is that so?-- Yes.

You also expect to have alarms when you are monitoring a sealed panel; is that so?-- You would assume that, yes.

Because once you seal a panel, you expect the CO methane to rise?-- Yes.

To monitor that you increase the alarm levels as you go?--

Yes.

So you have alarms going off during the period after sealing?-- Yes.

If you have a span gas test done at a time when you are monitoring a sealed panel, there is a possibility, isn't there, to create confusion with alarms going off?-- All depends on the operator.

I mean, in the ideal situation, the operator would be very attuned to the fact that he should be monitoring most closely perhaps the sealed panel but he has to deal also with the alarms going off in respect of the span gas testing?-- That's right.

Here we have the span gas testing taking place over the morning to about lunchtime or thereabouts on that same Sunday after the panel had been sealed?-- Yes.

The alarm log is clear evidence of the alarms continually going off?-- Yes.

And having to be reset?-- That's right.

It is undesirable, isn't it, to have the testing done on the days you were monitoring a sealed panel?-- I didn't even know this section had been sealed off when we scheduled it.

If you had known, would it have been desirable, again ideally, if you could, to postpone the testing to a time when you weren't closely monitoring the sealed section?-- That could have been done quite easily.

Thank you.

CROSS-EXAMINATION:

MR MARTIN: Mr Robertson, I just want to put to rest something that I raised with another witness. Can you just tell the Inquiry, please, how it was that the Unor was wired to the Con Log - by what means?-- In terms of how the wiring was connected up?

Yes, well, let me say this: my understanding is that there was a contact point on or within the Unor?-- Yes.

Now, what was the connection at that point to the Con Log?-- It would have been a set of points - you know, I couldn't say whether they were open or closed - that would trigger an alarm system on the Con Log.

But what I'm asking really is can you say whether it was a simple electrical plug that one sees-----?-- No, it is hard wired.

That's what I was asking?-- Yes.

Now, Mr Evans was the registered statutory electrician?-- Yes.

And he was also the calibration officer, I understand?-- Yes.

And in terms of the chain of command as it were in the electrical field, was he the superior of all of the electricians including yourself?-- Yes.

And then you are the foreman beneath him and then beneath you is the rank and file electrician?-- Yes.

So the rank and file take their instructions from you, or from Mr Evans, or from somebody other - or some other person in management?-- Yes.

Or undermanager?-- Yes.

How many electricians in the general body were there?-- We had 10 at that stage.

And it is not the electricians' responsibility, I suggest, to train or instruct anybody or any other person on the operation of the Unor or gas chromatograph?-- No.

Indeed, some of them don't know anything about it?-- That's right.

The system that went in on 27 July, that's the Unor, there was no real change except the computer - that was the only change, wasn't it?-- It was only the computer.

It was a Hewlett-Packard before?-- Yes.

And it changed to what?-- IBM.

Was it a Maihak supplied computer, or not?-- Yes.

Do you know a Mr Les Walters?-- Yes.

And he is a Maihak representative or salesman or expert?-- Technician, yes.

Did he come to Moura when the new computer went in?-- Yes.

And did he give some instructions as to how it was changed or how it was operated?-- I wasn't there at the time, but I believe he talked to a few of the electricians. The system is virtually identical. The old system was a touch screen and the new system was just replaced by a mouse.

You said, I think to Mr Clair, that the flashing rectangle at the top left-hand corner in alarm mode was a small red rectangle?-- Yes.

I suggest it is larger than small. What is its dimension?--

It might only be, oh, half an inch square.

And it is the case, is it, or I suggest it is, that also on the screen is a - against each monitoring point is the word "normal" with alarm up the top?-- Yes.

So that what you haven't told the Inquiry, I suggest - and I'm not imputing anything into this - when an alarm triggers in addition to the things you have said, the word "normal" goes to red active?-- Active.

From green?-- Yes.

Green normal, red active?-- Yes.

In relation to either the old or the new computer - Unor, that is - have you ever seen a brochure or a manual like that?-- I can't recall.

Just have a quick look at it if you would and say if it appears to relate to an identical system, particularly page 8 which relates to normal monitoring and gives you a typical screen replica?-- This is a bit different from our screen, yes.

Well, I don't know. What's the difference?-- I don't know what AN 1 per cent is or AN 2 per cent.

Leaving aside AN 1 per cent and AN 2 per cent, the balance is the same?-- Yes.

You have never seen a document like that?-- I can't recall whether we had earlier in the piece when the Unor was first installed.

It certainly wasn't lying around where any electrician could look at it?-- No.

Put that to one side. I'm not tendering that. The only training, as I understood your evidence, that you ever received on the Unor was very limited - in about 1990?-- On the Unor itself it was virtually just hands-on.

Teach yourself?-- We taught ourselves and we used to assist Les or whoever came out to do the six monthly services.

It follows from what you have said to Mr Clair, and indeed Mr MacSporran, that there was no Quality Assurance authorised person in relation to either the Unor or the gas chromatograph?-- No.

I would like you to put something else to rest for me, if you would? On the old Unor system - computer - was there a beeper as well as the visual alarm?-- Yes, there was.

What about the new one?-- No.

And can you help me with this as well: in the event of an unacknowledged alarm, was there a facility within the Unor

after a delay time of say 10 minutes for a phone to ring in somebody's house or somebody's office?-- We did have a system there that could ring out with a Unor alarm. That was only for when the colliery was unattended, and lately the colliery was attended 24 hours a day, seven days a week.

Well, was it operative on 7 August?-- I couldn't tell you. I wasn't aware of it.

When you were last there, was it connected and operative?-- As I said, it hadn't been used for a couple of years and I don't know whether it is still in a working condition or what.

I think you told Mr Clair that it was - I don't want to use words that you didn't use yourself - but in broad terms, it was a fairly simple matter to take a bag sample off the Unor?-- It could be done.

Well, really, it is only a question of taking a screwdriver, isn't it, and undoing one of the tubes?-- You would have to use a vacuum pump to draw it out of the line.

Well, give us an estimate of the time it would take to take the sample - undo the system, take a sample and reinstitute the system. Five minutes?-- That would be all, yes, if all the gear was there.

The Unor had the capacity, didn't it, for another gas analysis, apart from the four you have mentioned - hydrogen, except it wasn't set up for hydrogen?-- We didn't have a hydrogen analyser there.

But the system could do it, I suggest?-- If you put a hydrogen analyser in.

Can you say why that wasn't in?-- I could not say. I don't think it was needed.

Well, so far as you know?-- Mmm.

But you don't really have any knowledge, do you, except perhaps a smattering of what you have picked up about gas or fire?-- No.

As I understood your evidence, anybody could enter the Unor room and accept an alarm and reset it, assuming he knew what to do?-- That is right.

Or if he thought he knew what to do and didn't?-- That's right.

Can I take you to something that has arisen frequently in this Inquiry and that is a final monitoring point within a sealed area. What part did the electrical people play in that?-- We put the points wherever it was directed.

Directed by whom?-- By the undermanager, sometimes deputies - not behind a sealed point. It was normal undermanagers behind sealed points.

Or by a superintendent?-- Whatever, yes.

And the gas chromatograph, so far as you know, on 7 August was fully operational?-- We calibrated it and had it ready for when SIMTARS arrived on site. They went straight in the room and started using it.

Before the explosion, I'm talking about?-- Yes.

And the only obligation an electrician has or had at Moura No 2 is to undertake electrical work?-- Virtually, yes.

And the repair and maintenance of the electrical work?-- Yes.

And no responsibility whatever for determining gas levels, I suggest?-- It wasn't our field.

Or gas interpretation?-- No.

As your statement says - I'm sorry, you have answered that. I think you told Mr MacSporran - talking about sampling after a sealing, what about before sealing? Do you know of any occasion at all at Moura No 2 whilst the new or newer gas chromatograph was there that was ever used to take a - to analyse a gas sample out of the panel?-- I could not be quite sure, but I think there were a few occasions when it was done on back shifts.

Back shifts?-- Yes.

I'm sorry, I don't understand it?-- Afternoon shift, night shift.

A few occasions?-- As I said, that's all I could be aware of.

Could I just take you to Exhibit 10 - that is that document - the register of alarms list - I think you might have it there. That document?-- This one here? Righto, sorry.

MR CLAIR: It's Exhibit 127.

MR MARTIN: I think it might have two exhibit numbers. Exhibit 127.

If I might take you to the top, you have already dealt with this, but if I can take you to the first five readings during the set-up period on 27 July?-- Yes.

So, let's look at the next four readings. Now, there's an alarm on 2 August at 6.01, which is not accepted until 9.54?-- Yes.

And beneath that, on the 3rd, there is an alarm at 11.09 and not accepted until 19.05?-- Yes.

That's almost eight hours. The first alarm is almost four hours without acceptance. And then we will begin at the 6th. There is an alarm at 7.49, not accepted until 14.21?-- Yes.

Now, if the siren were connected to the Con Log and operative on those occasions, you would have had a siren blasting away?-- Yes.

For hour upon hour?-- Not necessarily.

Well, it wasn't accepted?-- That's the acceptance on the Unor screen itself. The siren could have been accepted.

I see. That's the point I was making?-- Yes.

Before 27 July do you know whether there is available for extraction from company records information such as on that sheet?-- No.

See, what I'm suggesting to you is that there was a management practice of not resetting the alarm?-- I don't think it was a management practice to do -----

Looking at that you've had hours of siren -----?-- As I said it's not necessarily hours of siren.

Unless the Con Log has been reset that's right, isn't it?-- When that alarm initially came up the siren would have gone, and if someone has accepted the siren, turned the siren off but then they haven't gone in and accepted the alarm on the screen itself. That's what that suggests.

Unless the alarm - unless the siren is reset it doesn't alarm, does it?-- The alarm will still come up on the screen.

Yes, I'm not suggesting it doesn't come up on the screen?-- The time you've got on here, time of alarm, is when the time actually - when the screen alarms.

Yes, and if the siren is -----?-- Active.

Is active it will go off?-- It will go off. It doesn't mean that the siren has been running for six hours.

What it means, if it's not running for six hours, is it hasn't been reset. It must follow?-- It would have been accepted as soon as the alarm came up that's what I'm getting at.

We are probably saying the same thing in different ways. The electricians' duties are performed elsewhere than in the Unor room, aren't they?-- That's right.

Everywhere about the mine, on surface or underground?-- That's right.

I think you said to Mr Macsporran that an electrician could accept an alarm or reset the values at the request of the undermanager?-- Yes.

And I suggest not otherwise?-- If he was going past there and the alarm was going off he could go in and do it himself.

Or might?-- He might, yes.

Thank you.

CROSS-EXAMINATION:

MR MORRISON: Mr Robertson, can I just ask you about the point that was just being discussed? It's not correct to say, is it, that electricians would only either accept alarms at the Con Log or acknowledge on the screen or reset only on the instructions of an undermanager?-- No.

If any of the management people asked an electrician to do it of course they would?-- They would, yes.

If they themselves thought it was appropriate to do it as they went past the screen or they heard an alarm they could do it then?-- They could do it, yes.

And that's been known to happen?-- Yes.

Likewise, if an undermanager is not present and a deputy, for instance, said to an electrician, "Could you reset the points or do the appropriate thing on the screen?", of course the electricians would do it?-- Yes.

It's important, isn't it, to be very careful about terminology that we use in relation to this process of alarms on the system?-- Yes.

There is a huge difference between accepting the alarm first up by hitting a button on the Con Log - that's what you call accepting an alarm?-- Yes.

When you actually go to the screen and do something there, it's better to call that acknowledging?-- That would be, yes.

Which is what we see in this alarm log?-- Yes.

And when it says "Time Acknowledged" that simply records the time when someone has actually punched in the numbers and hit the return button on the -----?-- On the computer, yes.

Even if you did all the steps, punched in the numbers and everything else and didn't hit the final return button it wouldn't give you this time until you did that final step?-- That's right.

Just because we have got a time for acknowledgment here, that actually tells you nothing more than someone took the step on the computer?-- That's right, only refers to the computer, yes.

It doesn't tell you anything about when someone heard the siren go off or saw the screen?-- No.

What we know from the document is the moment the screen went active because that is the time for time of alarm -----?-- Time of alarm, yes.

And it may be that someone saw and heard it instantly, hit the

accept button turning off the siren, and then did other duties until they got around to punching the numbers in?-- That's correct, yes.

So all we can tell from this is that at those acknowledged times that's when the final steps were done on the computer?-- That is correct.

And what this log doesn't tell us equally is that having done all those steps and punched the return button on the keyboard in order to complete the acknowledgment sequence, it doesn't tell you if the Con Log was then reset?-- That's correct.

So on the occasions that you were just looking at just a moment ago, those of the second through to 6 August - do you see those there?-- Yes.

Or all 512 top returns, it would be surprising to you, wouldn't it, to think that someone would let the siren run for hours?-- That's right, yes.

It's a sort of noise you just wouldn't tolerate?-- That's right.

It's almost certainly that the average person who accepted alarms or dealt with alarms would first hit the siren button off to get rid of the penetrating noise?-- That's right.

And then go to the screen and consider what to do?-- That's right.

And it may be that there are people who know perfectly well that if they hit the button on the wall of the Con Log that can turn that rotten noise off?-- Yes.

But they don't precisely know the steps to complete the sequence?-- That's right.

They go and get an electrician or an undermanager or someone?-- That's right.

So in terms of people being authorised to do things - and anyone with the appropriate knowledge can do this?-- That is right, yes.

It's entirely another question as to whether anyone with that knowledge would do this?-- That's right.

There are those at the mine who notwithstanding that they knew how to do it, probably wouldn't?-- They may not.

They might defer to the presence of an electrician?-- That's right.

Or an undermanager or someone else?-- Yes.

Notwithstanding that they have the skill?-- That's right.

And there are those who don't have the skill and wouldn't

contemplate touching it?-- That is right.

Those sort of persons, you know, you would expect in alarm conditions wouldn't stand around twiddling their fingers and wondering what to do, they would go and get someone like a leckie?-- That's what they should, yes.

You mentioned there were 10 electricians?-- Yes.

There would be electricians on every shift, wouldn't there?-- Normally, yes.

And probably more than one?-- Yes.

And electricians go down the pit only to do work?-- Yes.

They don't walk belts, stand at the face staring around?-- Sometimes they do section work. They stay in the section for a while, just do coverage.

Yes, but once their task is completed, their electrician task is completed, they are back out to pit top?-- Majority of times, yes.

So for the bulk of the day on a normal production shift sequence you would expect there to be an electrician on the surface?-- If we were fully manned, yes.

The occasions when you get every electrician required to be down the pit working on all the tasks at the one time must be pretty rare?-- Yes.

May be it's happened, but it wouldn't -----?-- It does happen but it's - there is normally someone within touch, within reach.

And likewise on a normal shift basis the place won't be deserted on the surface, will it?-- If there is men below there is always a bathroom attendant at least.

That's Ken Selff?-- No, it depends on what shift.

Sorry, you are right. It depends on the shift?-- Yes.

But there is always someone on the surface?-- There should be, yes.

And there would be no doubt, would there, that every miner at that pit would understand that if the siren goes off that's an alarm?-- Yes.

And the siren can go off for a multitude of reasons?-- That's right.

It could be electrical failures, whole power failures, equipment failures and so forth?-- That's right.

And the disabling, if one calls it that, the disabling of the siren on a Unor alarm by not resetting it still leaves it

available for every other alarm?-- That's right.

Which is why you could have it not operating for the Unor alarms but certainly operating for the BM1, for instance?-- Yes.

And that's simply a product of the fact that the Con Log has a number of channels?-- Yes.

And in fact that approach through the Con Log is a standard approach of an industrial Con Log, it's a multi channel, separate device?-- That's the only Con Log I've ever known, so -----

So there is really - as it was set up there is no chance really that if you didn't reset on the Unor that it would disable it generally?-- Just not sure of that question.

If you didn't go through the steps on the Unor alarm and hit that reset button you turn it off for the Unor alarms?-- Yes.

But that won't impact on its operation for the other alarms?-- No, it won't, no.

Can I just deal with some other matters, if I may? The purpose of taking the span gas tests, the main purpose is to obtain some times for the tubes?-- The main purpose would be to check the integrity of the lines.

You are right, and I'm assuming the integrity. The central purpose then is times, that's the -----?-- Not necessarily times, but to check the - make sure there are no leaks in the lines.

Sorry, having put them through and there is no leakage the focus then is on the times. You record the times?-- We do record the times, yes.

And that is for the purpose of comparing the times now with earlier periods and subsequent periods?-- Yes.

And a record of some sort was kept of the times not only in the sheets you filled out as you did the tests but there was a sheet on the wall as well?-- Yes.

Which recorded times for each point?-- Yes.

Can I ask you to have a look at Exhibit 11 again which I think you have still with you, that's the sheets that have dates cut off on them?-- Righto.

I'm going to ask you to look at this other document now. We have obtained from the inspectors just a moment ago a copy of the originals that were in their possession. Can we have a look at that document, please, which I've just handed to you? I'm going to tender it so I will hand copies to the panel and the parties. Can you put the document I've just given you and document Exhibit 11 side by side, please, and I want you to turn over the page on Exhibit 11. I don't need you looking at

what might be called the cover sheet. So we are comparing the pages for 7 August, do you see them?-- Mmm.

The one I've just handed you differs from Exhibit 11, doesn't it?-- Yes.

Several lines have been circled by something and figures at point 16 have been transposed, haven't they?-- Yes.

The 73 and the 85?-- Yes.

85 has been scratched through?-- Yes.

Do you know anything about how that came about?-- The figures themselves, why it was scratched or the -----

The transposition of those figures on the exhibit as versus the one I've just shown you?-- I imagine it's just somebody correcting the actual times. The original time was wrong.

That may be right, but you don't know the circumstances in which it occurred?-- I'm not too sure of it, no.

Or why it is that Exhibit 11 is as it is and the other one is as it is?-- I don't know about the circling the whole lines, 8 or 18.

You didn't do it and you don't know who did?-- I didn't do it and I can't recall whether - it's got Alan McMaster's signature beside it - whether he might have been talking to us at the time and just corrected the values.

We can now see the dates for these sheets, can't we?-- Yes.

The first is in order in which they appear, 7 August 1994, the second is 8 July 1994; is that so?-- Yes.

The third is 14 June 1994?-- Yes.

The fourth is 16 April 1994?-- Yes.

And the final one which is the QA document is 9 July 1994?-- Yes.

It's the fact that the 8 July and 9 July documents contain identical information in terms of the points?-- That's right.

And that suggests, doesn't it, that someone when they were doing the tests wrote out on the second sheet that we see and then that information was transposed to another -----?-- Transposed over to the QA document.

If you look at the second sheet which is the 8 July one, second from the front, you will see there that all the times are written down, that is the time elapsed?-- Yes.

Except for the last three points which are 5, 6 and 7. Do you see that?-- Righto, yes, yes.

And that would be consistent probably with the way in which the span tests were done. You would group points that were near each other within the pit?-- That's right, yes.

As 5, 6 and 7 are?-- Yes.

I tender that document. It's probably appropriate to make it 11A and place it with 11.

WARDEN: That document is admitted and marked Exhibit 11A.

ADMITTED AND MARKED "EXHIBIT 11A"

MR MORRISON: You've probably lost that document now, but I don't think it matters. Given what you've seen about the transposition of information in July from a draft sheet to a QA sheet?-- Yes.

It's reasonable to expect that the information for August would have in the normal course of events been transposed -----?-- Been transposed over, yes.

And no doubt it was interrupted by the events which followed?-- Yes.

THE COURT ADJOURNED AT 10.59 A.M.

THE COURT RESUMED AT 11.12 A.M.

FRANCIS MAXWELL ROBERTSON, CONTINUING:

MR MORRISON: I can assure Your Worship that the level of noise and the lack of attention is not out of any disrespect to the panel at all.

WARDEN: That's quite okay.

MR MORRISON: I just mention before I move on, document 100 in the Inspectorate documents is the original of Exhibit 11 in full form with dates, etc, etc. I don't know that I particularly wish to tender it as a separate document. Does anyone want me to? It's part of Exhibit 9.

Now, Mr Robertson, I was asking you about the Unor system and so forth. Can I turn now to span tests for a moment? From the description we have had of span gas testing, it involves two persons down the mine?-- Yes.

And an electrician on the surface?-- Yes.

Normally that system would not involve an electrician going down to put the tests in, he would be on the screen?-- There has always got to be an electrician at the screen itself. Sometimes we - if there is another electrician available, he will go down with the deputy.

And the purpose of having an electrician on the screen is because they know all the details of how the system works and can handle it?-- That's right.

And it may be, given as we can see from the logs that you have half a dozen points or four points all coming in at the one time and all deliberately designed to exceed set levels, that the electrician might leave the siren off while he was doing that job?-- Yes.

That is the Unor siren?-- Yes.

It would still be enabled for every other alarm?-- That's right, yes.

That would not be an unusual thing?-- If he was leaving the room at all, he would probably put the siren back on to know when the alarm came through.

From what I understand, if you move away from the screen it's best to reset, but while there it would be just a pain to have the thing going off all the time audibly?-- I would assume that, yes.

And the tubes for span testing are done in groups of two or three?-- Yes.

So that at any one time, leaving aside the question of this particular day, Sunday, you would only have those two or three on the screen?-- That's right.

And only those on the screen get sampled through the analyser?-- That's right.

This particular day, as you understand it, point 5 was kept on the screen the whole day?-- That's right.

With the consequence that it was indeed monitored more frequently than would normally be the case?-- That's correct.

Because in sampling through the analyser, obviously if you have four tubes it's quicker to go through four and get back to the original one than to go through 12 or 14 or 18 and go back to the original one?-- That's correct.

It is in fact the case on this day that whilst monitor 5 was kept on the screen, its monitoring time was down to something like four minutes? Would that be consistent with your expectation?-- That's right.

And assuming someone was looking at the screen, the natural consequence of that is that point 5 was being monitored at three times the rate that it would normally, four minutes as opposed to about 13?-- That's right.

Now, if one is injecting the gas into a Unor line down the pit and that line is not behind a seal, is the span normally put in at the monitor head?-- At the filter itself, yes, at the sample point.

The sample point hangs down from the roof. I call it a monitor head, sample point. It has a filter on it to prevent dust getting up?-- That's correct yes.

And it would actually be injected at that point?-- Yes.

Now, if the sample point is behind a seal, is there some usual practice about that?-- I couldn't exactly say whether it was usual practice to test that line, but it was done on that Sunday.

Now, have you been involved on occasions when span tests - spans of gas, I am sorry, have been put into a Unor line which is behind the seal?-- Possibly over the years, yes.

You can't get to the sample head obviously, it's behind the seal?-- No.

So, where do you put it in, or where would you expect it to be put in?-- You would have to break the line outside the seal at the nearest point, whether there was a junction there or a connector.

Now, let's just pause to consider that. The tube normally, if

it's a single line, is a plastic tube attached to the sealing?-- Yes.

If it's in a bundle, obviously you can't get at it unless you break the bundle?-- Yes.

If it's a single line, you either go to the nearest junction point?-- Yes.

Where there is a brass coupling?-- Yes.

Or you actually break the line and insert a coupling?-- If there is no couplings there, you would have to cut the line and put a joiner in.

And if you in the case of 512 when it was behind the seal, if you went to the nearest coupling, the pre-existing coupling, you didn't break the line near the seal?-- Yes.

Where would that have been? That's outbye some distance, isn't it?-- I know for a fact that it was done approximately a metre - a pillar from the seals itself.

About a pillar?-- Yes.

You know that from who, the electrician?-- Speaking to the person who put the sample in.

Who was that?-- Mick Caddell.

So, he put it in about a pillar outbye from the seal?-- Yes.

So, obviously then the time that that span took to get to the surface would be shorter than its comparative times before?-- There wouldn't be a great deal of difference, I don't think, because there was only another couple of pillars inside the seal where the sample point was.

But there is some difference in there?-- There would be a slight variation, yes.

And it would depend - the assumption that would have to be made about the times would also include that the line otherwise hadn't been altered in some way, pinched in the sealing process or anything else?-- I don't think, no - that would be correct, yes.

There is the theoretical possibility - whether it's real or not I don't ask you to say because you weren't there - but in the process of building a seal up against a Unor line you could put pressure on it?-- The line would have been put through the seal itself after the seal went through - other seal was built - no, I know what you mean, yes. There was a possibility, yes, that it could be crimped.

There is no way of telling, is there?-- No.

Because once the seal is done, no-one is going to go and break it down to see if it's crimped where the seal is?-- That's

right, yes.

Now, when the tube bundle system came to Moura No 2, was that before you arrived in '81?-- I can't recall how long the tube bundle system has been used altogether, how many years it's been used, but the new system itself was in '87. We did have another system down, the four end system.

There is a limited number of tubes available if one puts a bundle down or two bundles down?-- That's right.

There is seven tubes per bundle?-- It all depends on the configuration. You can get multiple, 10 core or 7 core.

What did you have at this mine?-- The original system was put down with two 7 core tube bundles, but they were added to over the years by single tubes.

If one wanted to run, say, another two points into 512 at the time of sealing, they would have to be taken from, one assumes, the closest junction box?-- That's right, yes.

Or at least the closest junction box which had available tubes?-- That's right, yes.

Can you say about this mine in that August position where the nearest junction box was that would have had extra available tubes not performing other duties?-- On that particular time it would have been approximately 13 cut-through on the 4 South road.

On the 4 South road?-- Yes.

So that's - turn to the map on the right. Take up the laser pointer, if you would, and indicate for us 13 cut-through on the 4 South road?-- It would have been approximately - it would have been around this area here.

That's in close proximity to another monitor point, is it, or at least there is a junction box there?-- There is a junction box there, yes.

So, do you know for a fact there were available lines at that point, or is that the nearest major junction box?-- That's the nearest major junction box. There was another junction box out along the main dip at 17 cut-through and we had in the previous two weeks before that - we had actually run Unor tube from 17 cut-through on the main dip down the 5 South road. We were in the process of trying to eliminate some of the problems down there.

But that extra tube bundle system wasn't operating?-- It wasn't operating at that stage, no.

In other words, it wasn't connected to the whole system?-- No.

So, you couldn't have utilised those for 512?-- No.

Well, in terms of those that could be utilised for 512 and which were available - that is, they weren't sampling relevant points elsewhere in the mine - can you say if there were any, and where is the junction point at which you would pick them up?-- At this stage I couldn't be quite sure whether there were any spares at 13 cut-through. If there weren't any spares, it would have to come from the main dip - approximately 17 cut-through or the main dip itself.

And run in new lines?-- Yes.

However you wanted?-- Yes.

So, even to run one extra point down into 512, that is one extra one apart from number 5 and number 16, which was available as well?-- Yes.

If you wanted to put a third point in, you would have to run a whole new line in from the main dip?-- Certainly from 13 cut-through on the 4 South road, yes.

And that's a task which electricians would perform?-- Yes.

Any idea of how long that might take if one had to run it, say, from - well, 4 South or the main dip?-- All going well, that would only take - oh, you could get it done under a shift, if everything was available - transport etc, etc.

Assuming everything else worked correctly for you, it would take about a shift?-- Yes.

You have mentioned that the system had been upgraded in '87. Was there an upgrade again in '90 or '92?-- That's right. We went from 12 channels to 20 channels.

And at this mine, then, one didn't just have a static system; it was being constantly improved?-- It was, yes.

Did that improvement include going from three-eighth inch tubes to a larger size?-- That's right.

Now, the times that were recorded on the document which you saw before, that is the times under the span test, time elapsed for a sample to come up the tube, are you able to make a comment about those in terms of their - whether they are unusually long, short, or anything else, or are they pretty much standard?-- As far as the pit was concerned they were standard. I have no knowledge of what happens in other pits at all.

Can I move to a different point? After a panel was sealed - you were referred to some examples in the alarm log of points being raised. Have you done that sort of work yourself?-- I have, yes.

And how does one determine how much to raise it by in that sort of situation? Is it just a judgment you make according

to the situation?-- You would have to, depending on the rate of rise of the gas itself.

It is not a standard thing, is it?-- Not that I'm aware of, no.

Any procedural system that was laid down saying, "Thou shalt raise it by five parts each time.", would be a nonsense system because it depends upon how fast each gas is going?-- That's correct.

So, it is classically the thing where someone who knows how to raise the points has to make a judgment on the - you know, to deal with it on the screen?-- That's correct.

That judgment might vary, even with the one panel, because the gas might increase faster at some stage or even slow down at some stage?-- That's correct.

So, it is classically not the sort of thing where you can lay down hard and fast rules, is it?-- Not that I'm aware of, no.

Accepted practice, as you understand it, I take it, from what you said before, is to increase it in short increments?-- Yes.

If one was attending at the screen - that is to say, someone was sitting at the screen specifically to watch the monitor point behind the seal - consistent with what we said about span tests a short while before, it would be quite an irritation to have the siren going off all the time, wouldn't it?-- Yes.

And it would be, if you were in that position, quite a sensible practice of increasing the levels as the gas was about to hit that level?-- That's right.

And if one did that - increase the levels as the gas was about to get there but didn't breach it - you wouldn't get anything on the alarm log, obviously?-- That's right.

Until such time as a point was put in and was allowed to breach?-- That's right.

Alternatively, if one was sitting there all the time and watching the screen and therefore seeing the red condition of alarms, it would hardly matter that the siren was off, because attention was being paid to the alarms?-- That's right.

And it would also hardly matter if the points weren't reset because one's watching the alarm levels and the gas levels?-- That's right.

So that consistently with reasonable practice one could, if one was sitting there and looking at the screen, allow the points to be exceeded over and over and over and over and over and finally think, "I'll now raise it 40 points, say, to cover that whole period."?-- They could do that, yes.

There is nothing unreasonable about that, provided that the person is at the screen?-- That's right.

Of course, in that sort of situation, you would have the alarms recording on the log?-- Yes.

Notwithstanding that the siren is disabled, if it alarms again on the screen, that alarm would be recorded in the log?-- If it had been accepted before, yes.

In other words, if you had had one alarm, hit the accept button on the Con Log and turned off the siren but done no more than that and it had kept alarming through that point?-- It would only alarm if that set point - you know, the set points were in front of it.

Yes, that's right?-- You would have to move your set points.

If you left the set points where they were - let's say a set point was 5 - let's deal with CO - 5 - that's low 1, high is 10; you get an alarm at 7?-- Yes.

That's between the two levels?-- Yes.

You hit the button, turn off the siren and do nothing more?-- Yes.

The next pass round it is 11, so it is above your high level?-- Yes.

It will show up an alarm again on the screen?-- Yes.

You can read the level on the gas, and the alarm log will show another alarm for gas high 2?-- Yes.

And if you did nothing more and sat there and the next pass around is came up 15, it will again show a gas high 2 alarm at 15 on the log, or you're not sure?-- I'm not sure. Did you actually accept the computer-----

You have done nothing by way of accepting?-- If you have got the one red light flashing all the time, you wouldn't be able to differentiate.

You wouldn't be able to differentiate in terms of red lights. Would it each put on the log each sequence of alarms, if you did nothing more than turn the siren off?-- I'm not too sure.

I am wondering - if we look at the log and we look at the jumps made in the set points, particularly for 512 seals and CO, we see it alarms once and then there is no more alarms until the next big set point is set, and all we are looking at is the log - whether it is possible that someone has turned the siren off, watched the screen very carefully and it is just rolling over the high points, but not recording in the alarm log because the alarm log recognises the earlier alarm; see what I'm getting at?-- I know what you are getting at, but I wouldn't be able to tell you, no.

Okay. In any event, you have got the alarm logs with you there? That's Exhibit 190 - or, I think, 127 you had with you. The raising of those levels for 512 seals, let's just go down them. The first one is at 11.16 p.m. It alarms there - gas high 1 at 5. That's the set point?-- Yes.

The next one is just after midnight, gas high 1 at 10?-- Yes.

And all that will tell us is that between those two times, at some point, the level was raised to 10?-- That's right.

Whether it is directly after 11.16 when the acceptance occurred, or the acknowledgement occurred, or whether it was a little later, who knows?-- That's right, yes.

And that's a very small raise. Then the next one which is five hours later - more than five hours later - it is 45?-- Yes.

Now, that's a big jump which you wouldn't normally do unless you were doing it incrementally ahead of the points?-- That's right.

Looking at this now, you would see that as being consistent with someone - as we know someone was there - on the screen raising the alarm level before it actually alarmed?-- That's right.

And then finally letting it sit at point 45?-- Yes.

Or breach the 45?-- Yes.

And the same thing might be said then of the jump from 45 to 60. It is three hours later - it took to make the 45 to 60. It is a gas high 1 again, which means the low level, so we are all talking about low levels each time, and it is quite likely that someone has incrementally upped over three hours - incrementally upped the set point level?-- Yes.

Ahead of the actual alarms?-- Yes.

That would be quite a sensible thing to do when we were considering a point behind a sealed panel, because you know it is behind the sealed panel that gas will be rising?-- Yes.

Especially CO and CH4 are hardly going to be dropping, so you know it is going to go up?-- Yes.

And the next jump, I think I'm right in saying, is considerably down to 11.26; is that right?-- Yes.

That's another three hours plus and that jump then is 20 on the set point. That's another gas high 1, low level?-- Yes.

Again, consistent with someone monitoring and incrementally upping ahead of an alarm?-- That's right.

And then the next one is for 512 seal of CO - is where? Can you pick it up?-- 10.28.

On CO. It is 10.28 in the evening, you are right. Gas high level again. It is 150. It is highly consistent with someone upping the set point level ahead of the alarms?-- You would assume that, yes.

Assuming someone is actually monitoring the screen, that's an entirely rational and reasonable practice, in your view?-- It would be logical, yes.

And none of that has any impact on the audible alarms for the pit; otherwise, regardless of what happens on this, the audible alarm for the BM1 for electricity and every other thing is still fully operational?-- That's right.

If we look down again to the second last line on the page - that's the next 512 seal's CO alarm comes in at 11.49 p.m. and it is a gas high 2, so it is the upper level?-- Yes.

At 200?-- Yes.

Not a gas high 1. So, at that point, the CO has gone past both alarm levels; is that right?-- Yes.

If it does go - if one has set two alarm levels - let's go back to our earlier example, 5 and 10 - and it comes in, say, a jump straight to 15, does the alarm log show only the gas high level?-- As far as I am aware, yes.

While we are looking at that log, you will see a variety of numbers in the right-hand extreme column. Do you see those? 77 is one, 358, 69, 11, a variety of numbers?-- Yes.

Now, none of those is inserted by you, I take it?-- No.

Just looking at those numbers, there is no way of you telling us who put them in?-- That's right.

Unless someone comes along and puts his hand up and says, "Yes, I put in 16", or, "69."; we can't tell?-- That's right.

And it is not right to say, is it - consistent with what you have just said - it is absolutely not right to say that this is just some random numbering, because someone may well have put 58 in or 69 as a deliberate exercise - deliberately putting a number that meant something to them in?-- That's right.

If it was - and likewise every number might have actually been inserted by a person choosing that number deliberately?-- That's right.

And consistently. It may be that a person who put one in at one stage, every time he goes there puts one in?-- That's right.

Now, can you remember that there was some suggestion that cap lamp numbers be used for this purpose?-- At one stage that was suggested, but it only goes up to 99 and we had 168 cap

lamps or whatever.

But not 168 persons working on this - nowhere near it?-- No.

In fact, every person has his own assigned cap lamp number?-- That's right.

So, if people were following that process and 58 was a cap lamp number, you could tell who 58 was?-- That's right.

And it may be that people - some people did follow that practice?-- That's right.

It may well be that some of these numbers are cap lamp numbers?-- Right.

And, of course, some cap lamp numbers were triple digit?-- That's right.

And you have only got the facility for two digits?-- Two.

It is possible that someone with a triple digit cap lamp number puts in their first two?-- That's right.

Because they can't put in their third?-- Mmm.

We can tell from the log of cap lamp numbers who had a number that matches this - you could do that, couldn't you?-- You could if you wanted to, yes.

In relation to the resetting of alarms that we have been discussing, we have referred to the fact that there was no written procedure; indeed, there couldn't be one unless it simply said, "Increase it by small increments."?-- Yes.

But it is the fact, isn't it, that there was an established practice about this - about how to deal with the resetting of points for a sealed panel?-- Could you rephrase that, please?

There is a usual practice - it might not have been written down, but people did usually follow-----?-- Follow some sort of a pattern, yes.

So, if you had Mr French going to do this, you would fairly well predict what Mr French was going to do?-- Yes.

Likewise any of your other leckies?-- Yes.

So it's not as if you had no way of knowing how people would approach this, there was a pattern of behaviour that was followed?-- Don't forget it wasn't always electricians either.

No, quite?-- Yes.

And if we know in fact that some deputies followed the same pattern, some undermanagers followed the same pattern, it sounds like a usual practice, isn't it?-- That's if they follow those patterns?-- Yes.

Can I just take you back to the log for a moment? One of the things I want to take you to, that second last point, nothing about the point itself but just that proposition that we talked about before. If you have an exceeding of gas high 2 it only records the gas high 2 alarm even though it has in fact gone past gas high 1?-- Yes.

And you cannot tell from looking at that log what had been done to the gas high 1 set point level?-- That's right.

So all we know is strictly what the document can tell us and that's all?-- That's right.

Now, you were asked whether if power failed and the emergency power kicked in whether that might automatically trigger the number 1 for authorities you see there on acceptances?-- Yes.

And I think you said emergency power would kick in and you didn't think that generated the ones?-- No.

Is there in fact a gap of time, however small, where the power is actually deprived to the machinery?-- If there was a power outage it comes back on under a minute.

That's the emergency power for this system?-- Yes.

So for that period of time at least the machine would be off?-- Yes.

Including the computer?-- Yes.

But not the analysers?-- Analysers as well, yes.

And then when power came back the computer would automatically reboot itself?-- Yes.

And is it not possible that if the computer reboots that it automatically accepts with the number 1?-- I'm not too sure of that, no.

The system was connected to a printer, wasn't it?-- Yes.

and every time you put in an acknowledgment of an alarm, the minute you did the acknowledgment and hit the return button on the keyboard you get an automatic print-out of the printer?--

That's right.

Record of that alarm, acceptance, time and so forth?-- Yes.

The print-out would pretty much reflect the information set across each data line here?-- Yes.

So in fact for every one of these alarms which was accepted - acknowledged, I beg your pardon - I'm falling into my own terminology trap - for every one of these alarms that was acknowledged there would have been a computer print-out?-- There should have been, yes.

That record would be in the company documents somewhere?-- Possibly, yes.

And that automatic print-out on alarm acknowledgment was the same under the old HP computer as with this new one?-- Yes.

When Mr Martin asked you about records under the old HP prior to 27 July, HP performed in the way I've mentioned?-- Yes.

So far as you are aware the HP retained in its memory, just as the new computer did, information about alarm logs?-- That's right

Now, I want to take you through a couple of sequences. Just before I do that, you were asked, I think by Mr Macsporran, was it feasible to have a system whereby if there wasn't an acknowledgment of an alarm for a certain period of time you could have an automatic reset so the siren would be available for other Unor alarms on other points?-- It would be possible, yes.

Except that there is a problem with that, isn't there? Because if it's just an automatic reset of the Con Log that won't in fact put the siren back on until you've gone through the acknowledgment and then reset process?-- I think there would be some way around it, but it might take a bit of thinking.

What you might have to have is an automatic acknowledgment and then reset?-- Yeah.

And there is some danger in that, isn't there?-- You couldn't have an automatic acknowledgment on the computer itself, no.

Because people might miss alarms entirely?-- You would only have to rely on the Con Log itself, doing modifications there.

I just want to take you through a sequence. I think you were involved in doing some tests on this system by way of a sequence of alarms and so forth?-- Yes, yes.

Can I ask you to look at this document, please? I've just handed you a schedule which I want to take you through. These are not theory, these were actual tests to see the way in which the system would perform; is that right?-- That's right.

Now, let's go through them. As we look at this schedule, just to identify it, we have - the numbers on the left-hand column are simply the number of tests done. The second one refers to the occasions on which an alarm was deliberately activated and "T" simply means "tube"?-- Yes.

For the purpose of this sequence we are going to go through, the actual numbers of the tubes don't matter, do they?-- No, that's right.

Then the next one is the occasions on which the activity of acknowledging and putting in an ID code occurred?-- That's right.

Then the next for acceptance on the annunciator?-- Yes.

By that, what we've been talking about, hitting the accept button on the Con Log?-- Yes.

Then the reset on the annunciator is the reset button on the Con Log and then the undermanagers's office?-- That's right.

"Siren" indicates, obviously, when the siren becomes audible?-- Yes.

And Unor alarm lamp refers to the flashing or steady light on the Con Log?-- Yes, that's right, yes.

Then "Screen Alarm Colour" - that's obvious - and "Remarks", simply to indicate what was - anything pertinent?-- That's right.

As we look down the pages there are dotted lines between 6 and 7, 14 and 15 and 21 and 22?-- That's right.

Do they indicate the end of a sequence of tests and then the commencement of a completely different sequence?-- That's right.

Let's go through them. It commences with the system being completely normal, then what happened at point 2 was alarm was deliberately activated with the result that the siren became audible?-- Yes.

The Con Log light flashed?-- Yes.

It's a white light, I think?-- Yes.

And the screen became red with the word "active"?-- Yes.

Then an additional alarm was brought in, but it doesn't matter for this sequence, does it?-- No.

But an additional alarm was brought in and the next in the sequence was that the annunciator was accepted. In other words, the Con Log "accept" button was hit?-- That's right.

The result was siren off?-- Yes.

Unor lamp stops flashing and becomes steady?-- That's right.

Screen still red?-- That's right.

The next step in that sequence was to hit the annunciator reset. In other words, not to go to the computer and acknowledge, but just to hit the Con Log reset straight away?-- That's right.

And the result was no change. Siren still off, Con Log lit up and red on the screen. So we can see from that that going straight to reset achieved nothing, does it?-- That's right.

The next activity in the sequence was to do the acknowledgment on the computer, that's line five?-- Yes.

The result was the siren is still off?-- Yes.

Unor lamp is - that is the Con Log light is still lit up and steady?-- Yes.

But now the screen has gone blue with the word "accept"?-- Yes.

Next in that sequence, line 6, the reset button was pushed?-- That's right.

That's on the Con Log?-- Yes.

The result was siren still off, Unor lamp goes off, that's the light on the Con Log, screen still blue?-- Yes.

Now as you've described it to us, with that first sequence the machine is now in a position where it will alarm again and audibly?-- Yes.

So at the end of that sequence of activity the siren is enabled, if one wants to say that?-- Yes.

The screen remains blue and performs in a way which you described before, only returning to green if on a subsequent cycle it's below the low point?-- That's right.

Now, by way of testing the next sequence to see how the machine actually performed can we turn to that, commencing at line 7? System made completely normal again, deliberate alarm put in. Line 8, siren came on. You would expect that. Con Log light flashing, screen red. Then the annunciator being - instead of accepting - pushing the "accept" button on the Con Log, this time just going straight to the reset on the Con Log?-- Yes.

The result was nothing?-- That's right.

No effect. Then "accept" button pushed on the Con Log?-- Yes.

Result was what we got in the first sequence, siren off, light

steady, screen red?-- That's right.

Then at line 11 another alarm was introduced, but it doesn't matter - it does matter here. The alarm came on the screen but no siren?-- That's right.

So the siren was still disabled for the Unor system?-- Yes.

Then next the reset button pushed again?-- Yes.

No effect again; is that correct?-- That's right, yes.

No effect on it. Then item 13, finally the acknowledgment put in with the result that the siren was still off?-- Yes.

The Con Log light was still shining and the screen had gone blue?-- Yes.

Finally the reset putting the system back to normal?-- Yes.

So from the first two sequences, in no situation where you get the alarms can you return it to normal without going through the acknowledge and reset process?-- That's right.

If you just go accept, reset or straight to reset on the Con Log it has no impact?-- That's right.

Beyond turning the siren off?-- Yes.

Next sequence again, to demonstrate how it worked, an alarm deliberately put in at line 15 and again what we saw above, siren on, light flashing, screen red and then straight to acknowledgment on the computer?-- Yes.

In other words no interception at the Con Log?-- That's right.

Impact, siren still on?-- Yes.

Light on the Con Log still flashing?-- Still flashing, yes.

But the screen goes blue?-- Yes.

And the print-out occurs?-- Yes.

Because you've done the acknowledgment part?-- That's right.

So in that situation there is in fact an acknowledged alarm which would print-out on the - be shown on the alarm log and give a print-out but the siren is still on?-- That's right.

And the Con Log light is flashing?-- Yes.

Next sequence in that sequence, item 17, to the annunciator accept line, that's hitting accept on the Con Log?-- Yes.

Turns the siren off and the Con Log light still goes steady?-- Yes.

So it still hasn't put the system back to completely normal, has it -----?-- No.

----- following this sequence. Then a new alarm comes in and what we find is the siren remains off?-- Yes.

Con Log light is still steady but the screen goes red?-- Yes.

So in that sequence up to this point, going straight to acknowledge -----?-- Yes.

----- and then reset, leaves the system open for a new alarm but without the siren?-- Yeah, that would be correct, yes.

So one could in fact do what one thought was right, that is acknowledge and reset, but in fact leave the siren off - sorry, not reset, acknowledge and then accept, if you hit the wrong button you have the siren disabled even though the screen is available?-- That's right, yes.

The next in that sequence was to then finally push the reset button. That had no effect and that's because the alarm at 18 hadn't been acknowledged?-- Yes.

So in item 20, finally, the acknowledgment for the alarm and as we have seen before, siren still off, lamp steady, screen blue?-- Yes.

And then as the final sequence, reset putting the system back to normal?-- Yes.

But screen still blue?-- Yes.

So putting the three sequences together, so far the only way in which you could deal with an alarm properly or in the right sequence which would enable the siren immediately for another alarm on the Unor - not talking about other ones, is to hit the Con Log accept?-- Yes.

Or go straight to acknowledge?-- Yes.

"Acknowledge" on the computer, hit the reset button on the Con Log. If you don't hit the reset button on the Con Log you've disabled the siren?-- You would still have to do the accept and reset on the Con Log.

Accept and reset?-- Yes.

The final sequence then of actual testing on the machine starts at line 22. Deliberate alarm put in, and as we have seen before, siren on, Con Log flashing, red "active" on the screen?-- Yes.

Then straight to acknowledge?-- Yes.

Siren stays on, light still flashing, screen goes blue and the print-out?-- Yes.

That's what we saw on the previous sequence at the start.

Then straight to reset on the Con Log?-- Yes.

Nothing?-- That's right.

Then to "accept" on the Con Log causes the siren off but the light stays steady?-- Yes.

And only goes out when the reset is done?-- Yes.

So we can see from this table which is not the theory but the actuality, precisely how this system works if you follow any particular sequence?-- That's right, yes.

And that covers pretty much all of the varieties of sequences that one might actually do?-- That's right, yes.

Con Log first, reset first or whatever?-- Yes.

I tender that table.

WARDEN: Admitted and marked Exhibit 154.

ADMITTED AND MARKED "EXHIBIT 154"

MR MORRISON: If I can take you back to the point that I was talking about before which was could you have a system which had an automatic reset, it couldn't be just an automatic reset, could it, because on the sequence that we have seen that wouldn't achieve anything?-- Yeah.

It would have to be in some way either an automatic acknowledge and reset or in fact on that sequence it would have to be an automatic acknowledge, accept and reset, acknowledge on the screen, accept on the Con Log, reset on the Con Log?-- Yes.

Or some other system?-- Yes.

It's not an easy thing to devise, is it?-- No, that's right.

And you certainly do not want the situation where automatic acknowledgements occur?-- No, you don't want that.

That would be very dangerous. Now, can I turn to another point, please? I am sorry, there is one point which I wish to deal with before we leave the actual system. Is it the case that the computer performed an automatic task every morning at 7.30?-- It gave us, if I can remember, an alarm report.

So, it would print out all the alarms for the last 24 hours?-- Yes.

And that document normally would be put on, or taken up by the undermanager or someone, whoever was on shift?-- Yes.

So, every day automatically one is given a record of the previous alarms?-- It gives a print-out of any previous alarm, yes.

Now, in terms of the undermanagers at No 2, am I correct in saying that you had had some role in teaching them, or some of them, how to use the system?-- I did show some of them, yes.

And all of the electricians knew?-- Yes.

And, as we have heard, a number of the deputies knew?-- As far as I know now, yes.

And no doubt there were individuals who might have known too?-- I can't be too sure on that, no.

But there were quite a number of persons at this mine who all had knowledge on how to deal with this system?-- Yes.

Now, you mentioned that you were at the mine on Saturday morning for a few hours, that's Saturday the 6th?-- Yes.

Was that a routine or scheduled attendance for you, or did you just drop in for some reason?-- There is only two, myself and Dennis Evans, and we take weekend about. We normally just made a habit of going out there every Saturday morning for a few hours to make sure the electricians knew their workload, etc, and we were on call for the rest of the weekend.

And on that Saturday were you mainly at the top of the pit?-- Yes.

Did you hear anything or did you deal only with electricians or did you have contact with miners as well?-- Only electricians.

Was anything said to you at that time about smells in 512, hazes in 512?-- I can't recall anything, no.

A heating, suspected heating?-- No.

No word of that at all?-- I can't recall anything, no.

Now, in relation to the gas chromatograph, there were a number of people at the mine from time to time who knew how to operate that system?-- Yes.

Even if you eventually became the bunny and shouldered all the responsibility?-- Yes.

And they included Mr Pattison, a Mr Kehl?-- Yes.

Mr Kington and Ken Selff that we have heard about?-- Yes.

All of those persons were trained in how to use it, how to calibrate it, how to put the bag samples through and so forth?-- They at least knew how to calibrate it.

And probably more?-- Yes.

And eventually Mr Selff was chosen to look after daily calibration of the gas chromatograph?-- Yes.

For a particular reason?-- Yes.

What was that?-- He was permanent day shift in the lamp room and he was the most logical choice. He was there every day.

And didn't go down the pit?-- No.

And there was quite a degree of time taken up on re-calibrating, or at least daily calibrating the gas chromatograph, wasn't there?-- It is time consuming, yes.

It would eat into the hours available to someone like an electrician?-- That's right.

It would be sensible, in your view, I take it then, to have someone designated to do that like Ken Selff?-- That's right.

And in its use, in so far as you used it or it was used at No 2, did anyone from the Inspectorate ever suggest to you that it should be done more frequently or differently?-- No, I can't recall anything like that.

Indeed, the members of the Inspectorate were out at the mine with some regularity, weren't they?-- Yes.

Did anyone at SIMTARS suggest that you should be using the gas chromatograph differently or more frequently?-- I think they were quite happy with what we were doing.

They certainly didn't voice what I have just suggested to you?-- No.

Now, just before I go to my last point with you, can I just ask you this: no-one from the Inspectorate has raised with you the way in which you were operating the gas chromatograph

was wrong in any way, and the Inspectorate, you said, were out there, or agreed they were out there with some regularity?-- Yes.

On visits to the mine, members of the Inspectorate would in fact go into the sampling room, Unor room or the gas chromatograph room?-- On some occasions, yes.

And they would know how you were operating it?-- I can't ever recall any questions, etc, etc, about how - the operation of it and how we were handling it.

And they never wanted to sit down in some formal session and say, "Now, listen, tell me, Mr Robertson, just how are you doing this thing?", and, "Now, you should be doing it some other way.", nothing like that?-- I can't ever recall anything like that, no.

Is it the case that the chromatograph came in after the '86 Inquiry recommendations came down?-- Yes.

And they were directed to there being no time gap in an emergency situation between it happening and the chromatograph being available?-- That's right.

Because in that case they had to ferry one up from Brisbane?-- That's right.

Via, I think, helicopter with all sorts of problems about scheduling pilots and delay?-- That's right.

And then having got it there, it was so shaken up by its travels that it took some time to re-calibrate?-- That's right.

And it was that that those recommendations were directed to?-- As far as I'm aware, that's right.

Directed towards the immediate availability of the gas chromatograph in emergency situations?-- That's right.

Now, can I ask you just to have a look at this document, please? Bring it back actually. I don't need Mr Robertson to identify it. I will just tender it. It's a letter from the Queensland Minerals and Energy Centre, Mr Lyne, to the Mine Manager at No 2 dated 12 September 1990 reporting on the result of an audit conducted by SIMTARS of the gas analysis and data interpretation facilities at No 2. That's gas analysis and interpretation - data interpretation facilities at No 2. I have nothing further from Mr Robertson.

WARDEN: Exhibit 155.

ADMITTED AND MARKED "EXHIBIT 155"

CROSS-EXAMINATION:

MR HARRISON: Mr Robertson, if I could just ask you something about the gas chromatograph. Was it the case that out at Moura you became part of the CAMGAS system in December of 1990?-- Yes.

And from then a relationship was built up with various officers from SIMTARS?-- Yes.

They were involved in initial training of the people who were to operate and maintain and calibrate the machine at Moura?-- That's right.

And were they involved in training of other people after the initial period of training?-- SIMTARS did hold sessions in Rockhampton on the odd occasion, you know, to incorporate any mines who were interested in sending people along.

And a modem contact was established at that stage, wasn't it?-- To SIMTARS, yes.

That involved, in part, forwarding of the calibration files to SIMTARS to detect if there were any problems?-- That's right.

On top of that, known gas samples were regularly tested; is that the case?-- We used - we calibrated it by using known gas samples, yes.

Now, was it the case that from that point on it was very rarely used in terms of sampling gases taken from down in the mine?-- That's right, yes.

It's been suggested in these proceedings that Mr McCamley may have used - taken bag samples one or twice?-- I am aware that I think he used to do the odd sample on the back shifts and get Andrew List to put them through the chromatograph.

Do you know of other people that used it?-- No, I'm not aware, no.

Was it the case that you built up a relationship with some of the officers from SIMTARS throughout that period of time?-- I got to know Col Hester very well, yes.

Did you get to know some of the others as well?-- Not as well as Col. We did meet a few of the others as they came through, yes.

Were there visits from SIMTARS officers to Moura No 2 in relation to the gas chromatograph?-- There were, yes.

Now, throughout the contact that you developed with these various officers, did anyone ever inquire of you as to why it was not being used more frequently?-- I can't recall them asking that, no.

Did anyone suggest to you that it should be used, say, in circumstances leading up to the sealing of any particular section - a section generally I should have said?-- I can't recall any request like that, no.

Was there ever any suggestions from any of the officers from SIMTARS that this particular device should be used in any particular circumstances?-- Not that I remember, no.

Was the contact more one of seeing that it was properly maintained and calibrated and seeing that it was there and available?-- That's right.

If required?-- That's right, yes.

And was it the case that the contact never went any further than that in terms of offering advice as to whether it should be used in particular circumstances?-- Not that I am aware, no.

Just on the gas chromatograph generally, was it your understanding prior to the explosion at No 2 that this particular device was unreliable in terms of accurately detecting carbon monoxide where the level was under 10 ppm?-- That's right, yes.

And from your knowledge, was that an understanding which appeared to be had generally by different officers out at Moura No 2 who may have had some contact or some familiarity with the gas chromatograph?-- The only way I found out was through Col Hester from SIMTARS, and he said that on the machine they used down there they had to use another analyser if they wanted to get accurate readings of CO below that percentage.

Did anyone from SIMTARS ever discuss with you the fact that Moura was, or No 2 - for that matter, Moura mines generally - were gassy and for that reason it would be advisable to use the gas chromatograph in the events leading up to the sealing of a section?-- I can't recall any.

If, for instance, there were ever any suggestions from the SIMTARS people that you should have used the gas chromatograph in certain circumstances, is that something you think you would remember?-- Sometimes my memory is a little bit weak, but I should have, yes, but I can't ever recall any recommendations or anything like that.

I have nothing further, Your Worship.

RE-EXAMINATION:

MR CLAIR: Thank you, Your Worship. Mr Robertson, you were asked a number of questions about the details contained in initially Exhibit 11 and then Exhibit 11A, which is the one with the dates on, and I just want to ask you to look at that document, if you would. Your attention was drawn to what appeared to be some difficulties for monitor point 8 on some of the sheets there: the sheet for 7 August and then on two other occasions where CO was being measured?-- Yes.

Where point 8 seemed to be, in some cases, well below the other points - the level of the other points, indicating that there seemed to be some kind of leak in respect of point 8?-- Yes.

I think you said. Can I ask you to go to that page which deals with the occasion when methane was in fact put through the system, and it's the 14 June one?-- Yes.

In 11A. Again, if you look at point 8 there, you will see that the methane reading also is at 2.1 per cent as opposed to - that's at point 8 - as opposed to all of the others, except point 18, which are between 2.5 and in fact predominantly 2.6?-- Yes.

So that again point 8 seems to be about - well, in this case it's about 20 per cent below, but certainly substantially below the other points?-- Yes.

And again would that indicate that there must be some explanation for that, and the only explanation you can think of is that there is some leakage in the system in respect of point 8?-- Yes.

Now, again, point 18 on that one also appeared to have some difficulties because it was also almost 20 per cent below the average of the other readings?-- Yes.

Well, let's put 18 aside for the moment because we don't seem to have any answers in relation to the behaviour of that even on 7 August, but looking at point 8, we have consistently over that series of sheets a situation where point 8 is below, and in most cases substantially below, the readings on the other points, which seems to suggest that whatever problem there was with point 8 persisted throughout this period of time of about four months in fact. We started at 16 April and finished at 7 August?-- Yes.

Do you recall whether there was anything specifically done in respect of that monitor point 8?-- I can't recall offhand.

Can you tell me what system was in place to deal with these apparent difficulties? Obviously there is an electrician involved in the carrying out of the span gas tests?-- Yes.

That's done, it seems, in conjunction with one of the duty, or

perhaps even two of the duty deputies?-- Yes.

And then this report is prepared, it seems, for the most part a report in the form of the written documents, and at least on one occasion here it's been transferred at least to a Quality Assurance sheet, but we don't know whether it's been transferred for the other occasions; is that right?-- That's right, yes.

Now, what happens after this report is prepared?-- If there are any anomalies, it is normally up to that electrician to notify somebody that there is something wrong and we try to rectify it as soon as possible.

So, as you understood it, at least, the responsibility for reporting anomalies fell into the electricians area and not in the area of the deputies who were part of the exercise?-- No, it should have mainly been the electrician.

So, the deputies were really there to assist the electrician?-- Yes, because they had to go into the returns.

Do you recall if the electrician was to report it, who would he report it to?-- He would report it to me.

Do you recall if anything was ever reported to you about difficulties with respect to monitor point 8?-- No.

Do you recall if anything was ever reported to you, either on the 7th of August or any other occasion in respect of any difficulties with point 18?-- I can't recall anything, no.

I know that 7 August and the days that followed were no doubt days of some turmoil, but did you ever receive any report in respect of all of these seemingly inexplicable alarms on point 18 during the 7th of August?-- No.

Not at any time?-- I can't recall any.

Even a week or two weeks after the explosion?-- No.

Now, tell me, again coming back to this question of what system was in place to deal with it, if it was reported to you, what steps would you take then?-- We would have to arrange a time to repair it, send people down to go through the lines, as I explained before, and see if we could rectify the problem.

Did you have any system or was there any system in place for you to report that to someone on the mine management side; that is, any anomaly with the Unor system?-- There was no recognised system, no.

So, there really was a danger that these written documents could be produced and it simply stopped there, nothing more happened. There was a danger under the system that existed - there was a danger that written documents could be produced showing the results of the span gas testing, but the whole thing could rest there, not go any further?-- There is a possibility, yes.

That danger, in fact, was realised in respect of point 8 - that seems quite obviously to have had some leak associated with it during the four months prior to 7 August?-- Yes.

Now, you have explained that the leak could have existed anywhere along a line - say, this leak in respect of point 8 - it could be anywhere in the line on point 8?-- That's right, yes.

Is it a fairly substantial exercise to locate a leak, or is it a relatively simple one?-- It could be at times, yes.

Now, of course, if there was a leak in the system, then that fact, in respect at least of the bundle or the tube - the point connected by the tube in which there was a leak, that would simply render the readings on that monitor point quite unreliable?-- It's possible, yes.

I mean, you simply couldn't put any reliance at all on the results that you received?-- Not going by those figures, no.

I mean, in some cases here point 8 is reading at a level that's not much above 50 per cent of what it should have been?-- Yes.

So that those readings would be quite unreliable?-- You would assume that, yes.

One of the other problems that could arise in the system is that the hoses could be pinched in some way?-- Yes.

And that could lead to an unacceptable or inexplicable time delay - when I say "inexplicable", otherwise inexplicable time delay?-- Yes.

I think your attention was drawn to some areas where there was a time delay that couldn't be rationalised?-- Yes.

Now, assuming that a hose was pinched in that way, what would be the effect on the gasses - or the mixture of gasses that were passing through that hose?-- As far as I'm aware, it would only slow the volume of gas down. It shouldn't affect the reading at all.

It wouldn't affect the mixture of gases?-- Just from an electrician's point of view, I don't think it would.

Okay. Well, putting that to one side, then, assuming a pinched hose isn't going to affect the reliability of your reading, the only problem with that is that it takes longer-----?-- The time lapse-----

Okay. Then there are two factors, other than any pinched hose, then, that would - or might affect the dependability of the readings: one is the question of a leaky hose-----?-- Yes.

-----or tube; the other factor, of course, is whether the system itself is reading accurately?-- Yes.

And at the outset of your evidence, what you said was that the accuracy of the readings would be checked in the event of one or other of two things happening, the first one being if there was some significant difference noticed between the Drager tube readings that were being taken down at the vent station, or the monitor point?-- Yes.

And the reading on the monitor - on the Unor monitor itself?-- Yes.

That is, the one that's being read by the Maihak, and that

depends on somebody drawing that to your attention or to the attention of someone else?-- Yes.

And that, in turn, of course, would depend on the - somebody who was aware of the Drager reading - that is, either the deputy who took it or somebody who has read that report, looking at the Unor screen and somehow comparing the Drager tube reading with a reading on the Unor screen that might relate to the same time?-- Yes.

Because you would have to have readings taken at the same time to make that sort of comparison?-- Yes.

Given that there is a time delay between when the samples actually taken at the monitor point and when it is analysed, it wouldn't be all that easy for a person to say, "Look, the Drager tube reading is different to what I see on the Unor screen and I think we ought to check the Unor system - the accuracy of the Unor system."?-- Are you still asking that it wouldn't be easy to-----

I'm saying it wouldn't be easy for somebody to realise that there is this difference between the Drager tube reading and the Unor or Maihak analysis reading?-- Yes.

Because of those factors that I mentioned?-- Yes.

One is that there is the time delay anyway, the other, of course, is that if a deputy does his Drager tube reading, he is not likely then to go to his Unor with his Drager tube reading and work out if there is any difference having regard to the time difference?-- Yes.

So, did that sort of thing happen very often as far as you were aware, that deputies or anyone else who had taken a Drager tube reading or knew of them suggested that the Unor screen was showing values that appeared to be out of kilter with the Drager tube reading?-- As far as I'm aware, it didn't happen very often at all.

Do you remember if it happened at any time?-- It has, yes.

And on those occasions has the accuracy or reliability of the Unor system been checked?-- It would have been calibrated - recalibrated.

You say it would have been?-- Yes. If anybody came and queried it with me, you know, whether it was an undermanager or the person - the deputy who normally corresponded with me was Allan Morieson, because he was the ventilation officer, and if he asked me to check it at all, I would do that, yes.

And do you recall whether he did ask you to check it as a result of an apparent inconsistency between a Drager tube reading and the Unor reading on any occasion? I know you say he would have. I'm just asking whether he did on any one or more occasions?-- I can remember being asked by undermanagers to check it out, etc.

Check out the Unor-----?-- Check out and just see what the reading was like and suggest that it might need a recalibration.

Because of the Drager tube readings?-- Or maybe just because of the readings on the screen and, you know, they must have compared it with something, but I'm not too sure how.

That then is one instance which would lead to a checking of the calibrations - the recalibrations of the Unor?-- Yes.

The other you mentioned was if there was some apparent inconsistency on the reading from point 14, which was at the pumps just in the next room?-- Yes.

You say you would know what the contents of the gases were in the normal atmosphere?-- Yes.

And if you noticed some differences there it would be checked and recalibrated?-- Yes.

Now, did that happen very often?-- Not very often, no.

Were there any other circumstances in which there was a recalibration of the Unor system, other than the two you mentioned?-- Not that I'm aware of, no.

Is there any automatic system within the Unor system?-- No.

For recalibration?-- No.

This system has been in place for a time. Certainly this current system, I think you told us, was installed when?-- 1987.

I would like you just to look at that Exhibit 155, if you would. That's the letter which was put in your hands, but which you weren't then asked to identify. Have a look at the first page of that Coal Mines Gas Analysis Audit. There are various items set out there. Look, in particular, just more than half-way down the first page, there is a paragraph headed "System Calibration Regime". It says, "The surface analysers are calibrated automatically on a weekly basis." Just pausing there for a moment; does that accord with your understanding of the system at all?-- That worked for a period of time and then it was taken out of the system.

Was it? How long was it working?-- Would have been a couple of years, I suppose.

A couple of years?-- Yes.

So you say it was an accurate statement at the time that the Mines Gas Analysis Audit was carried out, but it is no longer accurate?-- No.

Do you know why it was taken out of the system?-- We had at one stage or other - I think it was when Allan Morieson was the ventilation officer, he used to get the weekly reports to

go through and do all his charts, graphs, etc, etc, and after the weekly calibrations we found that we were losing some of the information from the computer - the recorded values. We asked Maihak to come up and see what they could find out. They couldn't really find anything wrong with the problem - you know, that it persisted. We were losing recorded values after the weekly calibration, so we discontinued the weekly calibrations.

The weekly calibrations were having some effect on the memory in the program in some way, were they, or-----?-- They reckon they couldn't find anything wrong with it, but it was just the way it was working, yes.

But certainly something was disappearing from the memory?-- That's right, yes.

And they were recorded values that really needed to stay in the memory?-- Yes.

You wanted to have a record of them?-- That's right, yes.

Okay. Well, when the automatic weekly calibration was removed from the system, was there any suggestion that there be some substitute; that is, perhaps, instead of an automatic one, a weekly manual calibration using the gases that were available in the-----?-- There was nothing more concrete put in place, but, as I said, we started doing calibrations as needed. There was no set time value. It might have been monthly, etc, etc, but it wasn't on a weekly basis.

Now, that paragraph continues, "Manual calibrations can also be carried out.", and that's what you have explained; that you can do your calibrations against the gases that are there and available for that purpose and already hooked up to the machine; is that right?-- Yes.

That's not a big job to do a recalibration?-- No.

And it goes on, "And the integrity of the tube bundle system is checked monthly."?-- Yes.

That's the span gas test?-- What we have been talking about, yes.

What we can see from looking at Exhibit 11A that you looked at, although there was consistently a problem with at least one point - point 8?-- Yes.

Nothing seems to have resulted from that?-- Yes.

"Maihak also provides a six monthly on-site service." I think you have mentioned that in your evidence already?-- Yes.

And, in fact, that had been carried out some time, I think you told us, towards the end of June-----?-- Yes.

-----1994. Okay. Just have a look at the last paragraph on that page which is headed "Alarm System". First of all,

before you do that, the calibration gases, there is a comment there, "One cylinder was in excess of 12 months old." Do you see that?-- Yes.

Is that a problem - if calibration gases are kept for too long, do they lose their accuracy - do they become inaccurate?-- I'm not too sure.

You see in respect of "Alarm System", it says, "Alarm situation demonstrated by audible and visible alarms."?-- Yes.

That's a true statement, isn't it?-- Yes.

Unless there has been a failure to reactivate the Con Log, in which case the inaudible alarm becomes unavailable?-- Yes.

It goes on, "The alarm is accepted by the entering of the respondent's cap lamp number." Now, that's, as far as you are aware, simply not the case?-- No.

I mean, you were the one who was very heavily involved in the running of this system and no-one had ever suggested to you that you should use - do you have a cap lamp number?-- Yes.

That you should use your cap lamp number?-- Mine's a three digit number.

But it's never been suggested that you might put in the first digits or anything like that?-- No.

Or the last two digits or any other set of numbers related to your cap lamp number?-- No.

You have, as far as you are aware, and as you have already told us, you have always just used a random-----?-- Random number, yes.

As far as you are aware, everybody else has done the same?-- Yes.

And that's always been the case since this system has gone in, as far as you were aware?-- As was pointed out, there are probably people who do use a set number but it is not recorded anywhere.

You are not aware of any persons using a set number yourself?-- No, not really, no.

And what you've told us, that is that, as far as you are aware, you don't use your cap lamp number, and no-one else uses-----?-- In most cases I do use mine.

In most cases you do use yours?-- Yes, because it is 111, so I can quite easily cover that.

But you have never been told to do that?-- No.

As far as you are aware, no-one else has been told to do it?--

No.

What I was asking you was: was that the situation right back from when this system was installed?-- Yes.

I mean, it is not as though for a time, for instance, around even the period of September 1990, that there was a system then of using cap lamp numbers but that system has been changed; that's certainly not the case?-- I don't really think it ever came into vogue, no.

Now, just while you have got that document there, on the following page, there is a reference to a CAMGAS system, and it has there "not installed"?-- That's right, yes.

And that's in respect of the Unor system, or does that-----?-- CAMGAS, yeah, that's a chromatograph.

That's in respect of the chromatograph?-- Chromatograph, yes.

Was it some time after this that the mine did subscribe to the CAMGAS system?-- Yes, it was in December 1990.

December '90?-- Yes.

So it was after this report-----?-- This report came out, yes.

-----that the mine subscribed or became a member of that CAMGAS system?-- Yes.

I have some further questions, Your Worship. I am quite happy to continue at this stage, but I know Your Worship mentioned 12.30 and that's the reason I raise it.

WARDEN: I think we will take the luncheon adjournment and come back. 1.45.

THE COURT ADJOURNED AT 12.40 P.M. TILL 1.45 P.M.

THE COURT RESUMED AT 1.45 P.M.

FRANCIS MAXWELL ROBERTSON, CONTINUING:

MR CLAIR: Mr Robertson, I just want to move to another area which arose during questioning, and in particular some questions that were asked of you by Mr Morrison about the sequence of things in relation to the alarm. I know you've been asked a lot of questions about this and I can say that there aren't many areas that I need to clear up in light of what you've said, but let me ask you this: he mentioned, of course, that there are two steps in relation to the alarm process once there is an alarm and a siren?-- Yes.

The first step is accepting the alarm which he has referred to in effect as accepting the siren and the Con Log?-- Yes.

Or accepting the alarm at the Con Log and thereby stopping the siren?-- Stopping the siren, yes.

And then the other step which we will call acknowledging the alarm is carried out at the computer screen?-- That's right.

Now, in terms of these gaps of time between the alarm itself and the registered time of acknowledgment of the alarm?-- Yes.

He was suggesting that what could occur is that perhaps somebody might accept the siren and then either not know all the steps to be taken in respect of the Unor system, perhaps even start to take some of those steps, even to the point of putting in the number, but he said to you until you actually enter the number and press the return key or at least activate the return key with the mouse it wouldn't go back - that is the alarm wouldn't be shown as being accepted. I think that was his suggestion in that log that you've looked at?-- That's right, yes.

Well, assuming that was the case, that either no steps were taken with the Unor, or alternatively some steps were taken but it wasn't actually taken to the point where the number was put into the box and then the return key was pushed, correct me if I am wrong, this is what would happen: the screen would remain with the - either it would remain with the alarm going on your normal screen?-- Yes.

Or if the alarm screen or acceptance screen had been brought up, acknowledgment screen had been brought up, what you would have is the acknowledgment screen there with a number shown on it but at that point waiting for the return key to be pressed?-- Yes.

And it would stay in that state until the return key was pressed?-- If the return key wasn't pressed my understanding would be that after a certain period of time it would revert

back to the main screen.

It would?-- Yes.

It would revert back to the main screen?-- Yes.

But if it went back to the main screen you'd have -----?-- Should still be flashing, yes.

Alarm flashing with the little thing flashing up in the top left-hand corner?-- Yes.

It would at least go back to the main screen where other readings could be seen?-- Yes.

Readings at other points?-- Yes.

Of course it's the case, isn't it, that unless that sequence was completed and the alarm acknowledgment actually entered in the way that we have just discussed by pushing the return - activating the return key then there couldn't be any further alarm on that point, couldn't be any further alarm on the Unor screen in respect of that point that had previously alarmed until the level went through the gas high -----?-- Through the higher level, yes.

I think in using Exhibit 154 which I'll ask you to look at, again correct me if I am wrong in this, what you did establish is that the Con Log cannot be reset for the purposes of a Unor alarm unless that alarm had been acknowledged on the Unor screen?-- On the computer itself, yes.

So that during any period where there has been an alarm which hasn't been acknowledged, and that is acknowledged by pressing the return - activating the return key which would lead to a log entry of the time of acknowledgment, during any period of time where it hasn't been acknowledged the Con Log can't be reactivated for a Unor alarm?-- That's right.

And therefore a siren couldn't go off?-- That's right.

It's, of course, been suggested to you that perhaps one explanation for these large jumps that you've seen on Exhibit 127 - and perhaps you should have that in front of you, that's the technicolour one there - one of the reasons that might exist for these seemingly large jumps in the set point values on Exhibit 127 was that there might be somebody sitting in front of the system and, as it were, keeping ahead of alarm points?-- Yes.

So that alarms weren't tripped?-- That's right.

Now you and I this morning went through that document and you did look at most of the aspects of it, but there is just one area that I didn't at that stage need to take you to and that was the gap of time between the time of alarm and the time acknowledged, but I think if you did examine that at least for part of that time, for instance, the first batch of 512 seal alarms starting at 2316 and nine seconds, that's about the

11th one down from the top?-- Yes.

If you look at that batch of them you will see that the acknowledgment of the alarm is in each case very shortly after the alarm itself?-- Yes.

Which might tend to support the suggestion that there was somebody sitting there and acknowledging alarms?-- That looks like it, yes.

And might even suggest that if that person was there then they might have been keeping the alarm ahead of the rising gas levels?-- Yes.

But I want you to look at another set. Come down to 7 August at 2.31 in the afternoon, 1431 and 33 seconds. Do you see that there?-- Yes.

512 seals. It's an oxygen alarm, decreasing oxygen level, and you will see that that alarm went off at 14:31:33?-- Yes.

But the time of acknowledgment was in fact 27 minutes later by the looks of it?-- Yes.

14:58:21. Now, the net result of that was really that the siren could not have gone off in respect of any Unor alarm during that period, the 27 minutes?-- That's right, yes.

Because that alarm hadn't been accepted?-- That's right.

So during this period of 27 minutes if there had been any other Unor alarm on any other section or any other point, monitor point, it certainly wouldn't have caused a siren to go off?-- That's right.

Might have come up on the screen but wouldn't have caused a siren to go off?-- That's correct.

Have a look at the next one and you will see that the next alarm goes off at quarter past eight in the evening?-- Yes.

20:15:39 and you will see that in fact that alarm wasn't acknowledged until 23 minutes past midnight the following morning?-- That's right.

So that during the whole of that period, on what might be described as a fairly crucial night in terms of activity in the mine, during the whole of that period the siren could not possibly have gone off in response to a Unor alarm?-- That's correct.

Because unless that alarm had been - unless the Con Log had been reset in respect of the alarm at quarter past eight, unless the alarm had been acknowledged, at least that Con Log couldn't have been reset?-- That's correct.

And it wasn't acknowledged until 23 past midnight. And you will see the next one, of course, is again not acknowledged until 23 past midnight and the next and the next, right

through?-- Yes.

Right through until the beginning of the batch that were obviously associated with the explosion?-- Yes.

So none of those five impacts from the one at 2.30 in the afternoon forward - sorry, from quarter past eight in the night-time through to the time of the explosion, none of those could have caused the siren to go off?-- That's correct.

In response to those Unor alarms?-- Yes.

You were asked also about the proposal for some sort of automatic reset on the Con Log and it was suggested to you that such a thing wouldn't be practical because it, in effect, would require the automatic acceptance of an alarm on the Unor, at least that seemed to be the basis on which it was suggested to you that that sort of thing was -----?-- Yes.

But let me put this to you: the area of danger really is where there is not somebody sitting at the Unor screen?-- That's correct.

And where there is no audible alarm, no siren going off; isn't that so?-- That's so, yes.

So that really the area that has to be addressed is the automatic resetting of the Con Log so as to register alarms. That is, so as to have audible alarms for any other alarm points, monitor points that alarm but haven't been accepted?-- Yes.

Now there is really nothing to prevent that being done, is there?-- You should still be able to devise some system, yes.

Just to reactivate the Con Log after a certain period of time?-- Even if you brought up another alarm in 10 minutes time or something like that.

A second alarm?-- Yes.

Exactly, to swing in so that this danger of human error in not resetting the Con Log can be overcome by some automatic system that establishes some audible alarm for further alarms on the Unor system?-- That's right, yes.

Thank you.

EXAMINATION:

MR PARKIN: Mr Robertson, did I understand you to say in your evidence that there were three people trained initially on the gas chromatograph?-- That's all that there would have been, yes. There were other people shown the basics of it, but they never really followed it through.

But how many were trained on the gas chromatograph?-- There was myself, as I said, Bruce Danvers, and at one stage we got the chemist in to be - he learnt how to use it as well.

So Bruce Danvers left so that leaves two people?-- Yes.

Those two people were authorised to use the chromatograph?-- Yes.

And no-one else?-- That's correct, yes.

The other people were only shown by example or whatever?-- Yes.

Do you think that's satisfactory?-- I wasn't aware of any other needs et cetera et cetera.

Well, how many people do you believe in your capacity since you were in charge of the - or you've been given the charge of the Unor operation, how many people do you think should have been trained? If that's an unfair question, don't answer it?-- I don't really - I couldn't really answer that.

Did I understand you to say that you did not even know that 512 had been sealed until you came to work that Saturday morning?-- That's right, yes.

Do you find that strange since you were in charge of the Unor system and have extensive experience in the gas chromatograph?-- It does seem strange, yes.

Are you happy about that?-- I had no say at the time, so -----

But, you know, is that good communication? Here we are sealing the panel, you've got extensive knowledge of the Unor system and indeed the gas chromatograph, and you don't even know the panel is being sealed?-- No.

It's not really good communication, is?-- No.

Could I just return to a subject that was initially raised by Mr Martin and I was a bit confused by your answer, and has subsequently been raised by Mr Clair, and it's regarding these alarms. I think - have you still got the log in front of you?-- Yes.

Now, taking notice of what Mr Morrison has gone through this morning, and I certainly understand a little bit more about how the system works, but the thing that I fail to understand even now is the time it takes to acknowledge the alarms. Now, if you look down that log you will see that roughly, I'd say - what is there, 80 per cent of the - or probably plus 80 per cent of the alarms have been acknowledged in a reasonable amount of time. Now, can you tell me, for instance, if you look at point 16 there is four points there and the dates are 2, 3, 5 and 6 of August, I mean the acknowledgment extends from three hours to eight hours?-- Yes.

Can you explain that?-- No, because if I wasn't there I

wouldn't have known who actually acknowledged the system. A number of people were able to acknowledge the alarms. I wasn't the only one in control of the whole system, and if I wasn't there, well an undermanager, a deputy, an electrician, anybody who was in the vicinity could accept an alarm. It was not my sole responsibility.

That in itself is not a good procedure, is it?-- It's not, no.

So, really you can't answer that question?-- No.

Well, you said you can't answer it. My colleague has just mentioned to me would there be anybody in the room at that time, and you did mention earlier in your evidence that there was 24 hour coverage there?-- That's right. Say, for instance, a bathroom attendant - the siren went, he came around and reset the - stopped the siren, he should have notified somebody - if he wasn't capable of resetting the alarm itself, he should have notified somebody in charge, an electrician, a deputy or an undermanager that there was a Unor alarm up. That is my scope of -----

Okay, I understand what you are saying. I have got a few questions here that might clarify that situation for you. You have said that there were no written procedures?-- No.

Why is that?-- I couldn't actually say.

How can you possibly operate a sophisticated system like we have got here without written procedure?-- As far as I am aware there was no written procedure. Whether it was just people gaining the knowledge over the years and they knew how the system worked.

But what I am saying is if you are going to work a system like this that is very sophisticated, do you agree with me that you need a proper procedure -----?-- There should be, yes.

----- to operate it?-- There should be.

Thank you?-- I think, just to add to that, what a lot of people get away from the fact is that I was there to maintain the system, not to run it.

I am in no way being critical of you, Mr Robertson. I am just trying to get the facts on the table; that's all the questions are about, the facts?-- Yes.

Well, could you tell me: how many people actually worked on the system? Now, we have heard about electricians and undermanagers and deputies. Would you know the number of people that worked on the system at one stage or another?-- I know that virtually all the electricians know how to operate the system, the undermanagers would have, but I'm not too sure how many deputies knew the system itself.

Were these people authorised to operate the system?-- There

was no written authorisation that I know of.

So, nobody was authorised to operate the system?-- Not in a legal aspect I don't think, no.

Well, can you explain this to me: you know, how did you control the system; how did you control the people?-- Who actually knew how to operate the screen itself?

What I am trying to suggest is this: that if you were in control of the system - I mean, somebody has to be in charge of it?-- Mmm.

Because if you have got every Tom, Dick and Harry sort of accepting or being involved in the system - I mean, what about one undermanager may do something who may not know all about it, or a deputy. I mean, how is the whole thing coordinated, if at all?-- I don't think it's got a - I could really answer that in fine lines. People learnt through just custom and practice. It was restricted to people with some sort of authority; as I said, undermanagers, some deputies and electricians who had some sort of responsibility.

I accept your answer, Mr Robertson. I am just a bit amazed as to how the system can work with so many people involved and without a written procedure and without real legal people knowing what they are doing, or that's how it would appear?-- It's something that when we finally got under Quality Assurance, this might have been rectified.

So, that was going to be addressed, was it?-- Everything at the mine site was going to be addressed.

Well, there has been reference been made to the gas chromatograph. Do you agree that during sealing operations, if you have got a gas chromatograph, why wouldn't you use it?-- You would assume that it's there to be used.

Otherwise what would a gas chromatograph be for?-- That's right.

Why do you train people if you don't use it?-- Yes.

Mr Robertson, I have just got one minor question involving another matter: you are involved in all the electrical activities at Moura mine?-- Yes.

Could I just ask you a question regarding cable flashes?-- Yes.

It was established yesterday that you average approximately between 6 and 7 reportable incidents per annum?-- Yes.

Was that a concern to yourself about the number of reportables?-- It was a concern to everybody.

Now, I asked a question yesterday. Do you believe it's high by industry standards?-- We haven't really got records from other pits. I will say that we were quite honest and did

report everything. We were very good in that respect.

And the final point: to what degree was the Electrical Inspector involved in these reportable incidents?-- Well, we just had a new system brought in - we did report every reportable to Alan McMasters, and it might have been brought to your attention yesterday that Albert had brought another system in where the machine was stood down until a thorough investigation was done either by an electrical foreman or supervisor and a group of people, or even on the odd occasion Alan McMasters himself came out and that machine wasn't used until a thorough investigation was carried out.

Is there any one of those incidents that you could recall was worse than any of the others, or were they all of a similar nature?-- I think the majority of them are just similar occurrences through car cables. I couldn't put a degree of intensity on each one.

Thank you very much.

EXAMINATION:

MR NEILSON: Just one question, Mr Robertson. Can we go back to the alarm log, please?-- Yes.

You will see the last reference to 512 seals - not the last but the second last reference to 512 seals?-- Yes.

You will see a number of acknowledgements all at the one time on 8 August?-- Yes.

At 23:12 in the morning?-- Yes.

If you go to the last reading - the last acknowledgment before that which was at 14:50?-- Yes.

On 7/8?-- Yes.

Am I correct in assuming that there would have been nobody present in that room for that period of time?-- It does look that way, yes, because of the time frame between the acknowledgment.

I mean, that was a pretty critical time, wasn't it?-- That was, yeah.

Thank you.

EXAMINATION:

PROF ROXBOROUGH: Mr Robertson, just a few questions to tidy up some uncertainties in my mind, if I may. Tell me, what is or was the availability of the Unor system? It was something less than 24 hours a day, seven days a week, one presumes?-- It was available, yes.

For that time, seven days a week, 24 hours a day?-- The Unor system itself?

Yes?-- Yes.

And the screen was switched on?-- Yes.

All of the time?-- Yes.

And it would be true, would it not, that for most of the time the screen would be unattended?-- Yes.

For what proportion of the time would you have any idea that the screen was attended, that there was someone there?-- It would only be attended by anybody actually wanting to use the screen, anybody looking at the screen.

On a casual basis?-- On a casual basis, yes.

So, for most of the time the only means for alerting people to the fact that the said value of a particular gas had been exceeded was the siren, was it?-- Yes.

I think you said that the siren is not exclusive to Unor?-- That's right.

It does several jobs. So, the siren doesn't tell you which of the systems covered by the siren is in the alarm mode?-- That's right.

So, how do you find out?-- You have to actually look at the Con Log panel to see which lights -----

The Con Log panel itself tells you?-- Yeah, what fault is up.

Would it be an easy matter for the Unor to have its own exclusive and distinctive siren?-- That would be possible.

Would you see any advantage in that?-- Well, we have found out now that it would be an advantage, yes.

At critical times requiring special attention to the Unor system when you need rapid information on mine gases such as when you are sealing a panel, it's practicable and sensible to have someone in attendance at the screen all the time, is it?-- You would imagine so, yes.

That would be the prudent thing to do, and at such occasions

at Moura was that the case?-- Not to my knowledge.

Is there only one screen for the Unor system?-- Yes.

Would it be an easy matter to have other screens elsewhere with keyboards?-- I'm not too sure of that.

If it were possible, do you think it would be an advantage?-- It all depends whether there is anybody to actually watch that other screen.

Finally, we heard yesterday that the Drager sampling instrument has an intrinsic accuracy, which I think possibly surprised a few people, in which the standard deviation is described, or relative standard deviation is given at 15 per cent. Is there a similar figure, similar standard deviation, given for Unor results or Unor data?-- I couldn't answer that, no.

Thank you.

EXAMINATION:

MR ELLICOTT: Is it the case that the Unor system draws sample through lines by virtue of four pumps?-- There are four pumps there, yes.

And of those four pumps are three of those known as purge pumps?-- It would be purge, yes.

Their main function is to continually pull sample through the sampling lines?-- That's right.

Now, the fourth pump is commonly known as a sample pump?-- It would be, yes.

And through switching solenoids the sample lines are scanned on a sequential basis to put sample through the sample pump and then through the analysers?-- That's right, yes.

Does this arrangement result in what might be called a sampling frequency, and that is for any one line that line is sampled at a certain frequency?-- I'm not too sure of the way you want the answer.

Would it be the case that in normal operation with, say, 12 lines active, the effective sampling frequency would be about once per 13 minutes?-- Yes, that would be approximate, yes.

And then the sampling duration, in other words, the time that sample was actually pushed through the analysers, would be approximately -----?-- Approximately one minute.

----- one minute?-- Yes.

Now, you mentioned yesterday that in conducting span tests, operators underground would inject span gas into the lines for five minutes?-- Yes.

Now, that was when there were three, and if a continuous point was being monitored like 512, there were four active points on the system?-- Yeah.

Can you tell me why the span gas was put in for, I would gather, at least five minutes?-- That's to allow the cycle to go through - say there are three points up on the screen. If you had at least five minutes of gas in the line, you should be able to get at least a result on, you know, that line.

So, would you say it to be true that you had to have the sample injection to be of a time equal to or greater than the cycle time for the Unor system?-- Greater than. That's why we used to put it in for at least five minutes.

Now, if you put span gas in for less than five minutes, would there be a possibility of an erroneously low reading or in fact in some cases for this system to totally miss the gas?-- That's right, yes.

Don't those same principles apply to normal sampled gases?-- In normal operation?

In normal operation?-- Well, you have got the - you have got gas coming out of the tube continuously. It doesn't just sample for five minutes.

But the system, I would suggest, only effectively samples for one minute after each 12 minutes?-- Yes.

So, unless it happens to be sampling a line, anything coming up that line bypasses the analysers and may not be seen?-- The gas is coming up the lines continuously.

Yes, but it's not going through the analysers continuously?-- No, it's being vented to fresh air.

If it's being vented, it's not being seen by the analysers?-- That's right.

So, as is the case with a span gas, if a particular concentration of gas doesn't go into the end of the sampling line for a period at least equal to the cycle time of the system, there is a danger (a) that in the worst case it may not be seen at all?-- Yes.

Is that true?-- That would be right.

Or in a slightly better case, may produce an erroneously low result?-- That could happen, yes.

I suppose the inverse is possibly true, an erroneously high result, but that would be hard to imagine?-- Yes.

What do you understand to be the basic purpose of alarms?-- To give an indication of change of trends in the mine atmosphere.

Would you agree that they may be to draw attention to events?-- What sort of events?

Well, I would suggest they may be essentially unexpected events to provide some alert?-- Yes.

And would you agree that where events are really expected, then the importance of alarms is somewhat diminished if people are watching the system by other means?-- If they are continuous monitoring, well the alarms are not really needed.

Do you still have Exhibit 11A?-- No.

Could the witness have 11A, please? Can you turn to the second last page of that which is the span test for the system for 16 April?-- Yes.

In the top right-hand corner you will see that the words appear "gas bottle 44"?-- Yes.

All the gas readings are substantially lower than that. How do you explain that?-- Well, whether the bottle itself was getting on a bit, had diluted, but what we were mainly looking for is consistency in the readings. There may be some dilution in the sample gas itself, that's what I am trying to say. The bottom may have been marked "44".

So, that gas bottle may be a bottle identification or it may be a concentration, or what may it be?-- I imagine the "44" there is what was taken off the label on the gas bottle itself.

But it wouldn't concern anybody that the results are in the low 30's, those that were consistent anyway?-- I think the people would have looked at the consistency of the readings. As I said, they are all around the 31, 32, 33.

Would there have been any other test for some other systematic error in the system such as that the analyser was reading about 75 per cent of what it should be?-- No, I couldn't answer that.

I notice in looking at these that there are no results for May?-- No, they may not have been done. We had initiated scheduling the results monthly, but on some occasions whether it was unavailable, we didn't have any deputies or electricians available at that particular time.

Are you aware that the calibration of gas monitoring systems is the subject of an Australian Standard?-- I've found that out, yes.

So, you are aware?-- At this stage, yes.

You weren't at that stage?-- Not particularly, no.

Can you tell me when that Standard was produced or published?-- No.

I would presume that at the mine there is some maintenance system for the maintenance of electrical apparatus; would that be the case?-- Yes.

Would that system include something akin to defect reporting?-- We do have a defect - yes - reporting system, yes.

You have some means of fulfilling that function?-- Yes.

Do you have some means of following up that defect reporting to ensure that defects are rectified?-- I'm just not too sure of how to answer that type of thing, but we did have a defect reporting system coming in and it was a book system - a note system where people filled out a defect sheet and if it had anything to do with electrical, they would pass it on to us.

That was another system in the throws of introduction?-- Yes.

You don't appear to have had or were developing an equivalent system for the Maihak; would that be the case?-- Not at that stage, no.

Would it be fair to say that the Maihak may have been seen as something of a peripheral system at the mine; perhaps not as important as electrical apparatus or mechanical maintenance schemes or whatever else?-- Not as far as we were concerned.

As far as you were concerned, it was just as important as those other systems?-- I think it was important to everybody, because people did rely on it.

Do you think it was maintained to the same standard as those other systems?-- I think it was a very reliable system.

So it didn't require maintenance?-- It did not get maybe as much maintenance as the Standard suggests, but-----

Did it get as much maintenance as other systems at the mine got on a comparative basis?-- Possibly not.

So, perhaps it was, in that respect, something of a peripheral system?-- If you want to put it that way, yes.

Thank you, that's all.

MR CLAIR: Just one short matter arising out of that, Your Worship.

FURTHER RE-EXAMINATION:

MR CLAIR: Mr Robertson, the position that was canvassed with you by Mr Ellicott was that there would be 12 stations?-- Yes.

And this was put to you hypothetically, in a sense - 12 stations which would lead to a sampling once in every 13 minutes; is that right?-- Possibly, yes.

At the time of the incident at Moura, were there 12 stations, in effect, on the system then?-- 13 I think it was, yes.

13 on the system. That included the pump-----?-- Pump room, yes.

Was that the maximum number of stations you had on there, or had there been a time at which there were more stations on it?-- I think at times there had been more stations. It had the capability of monitoring 20 points.

Do you know just what the maximum number of points were?-- No, I wouldn't know off-hand, no.

During the period leading up to 7 August - I am, in particular, looking at those records in 11A over that four months - was it the case that there were just those 13 stations?-- Yes.

And does 11A confirm your thinking in that regard?-- Yes.

I have nothing further, thank you, Your Worship.

WARDEN: Thank you, witness. You may stand down.

MR MORRISON: Sorry, Your Worship.

WARDEN: Sorry, you may not leave.

FURTHER CROSS-EXAMINATION:

MR MORRISON: Mr Robertson, I just want to ask you a number of things, if I may? Firstly, when the Unor screen is in alarm mode and you go to the next screen, which is the panel for numbers to be inserted?-- Yes.

It is true, isn't it, that the words that appear on that screen near the numbers are: "Enter lamp number (1-99)"?-- I can't recall off-hand.

You can't recall?-- No.

No doubt we will be able to show it. Now, you were asked about point 8 and point 18 showing up slow on Exhibit 11A. I think you've still got that?-- Yes.

Now, you were asked by Mr Clair a number of questions about the system to follow up those low readings; do you recall those questions?-- Yes.

Low readings would be rechecked, wouldn't they?-- Yes.

And that was routinely the case?-- It was normal routine by an electrician to initiate - you know, recheck that sample.

For the purpose of finding if there was a leak or at least examining what the problem was?-- Yes.

We have heard from Mr Caddell in this case that he, in fact, had noted that the point 8 was low that day and intended to recheck it the next day, and that's not surprising, is it? Deputies-----?-- That's right, yes.

That would be a routine thing for him to do - a deputy to discover the defect, notify people and then check it the next day?-- That's right, yes.

And where point 8 is, if you look up to your right at the map, I think I'm right in saying that point 8 is located at the furtherest extension of the main dip - it is the closest monitor point on the north-east side of the main dip in the direction of 1 North-west?-- Right.

Well, can you see it on that map or not?-- I can't see the actual number, but-----

Are there numbers on that map for the monitor points? Perhaps not. Let me give you one and then you will be able to see it. To save time, I'll give you mine. Have a look up on the north eastern side of the main dip. You will see the closest monitor point to 1 North-west is point 8?-- You need a magnifying glass.

Could the witness see, from the exhibit that contains the maps, drawing number 47/7-A?-- Away you go.

Have you got your own one? Okay. Have a look at the position I indicated. Can you find monitor point 8?-- Yes.

Which cut-through is it on the main dip? It is up around 29 or 30, isn't it?-- Approximately that, yes.

It is the closest monitor point to 1 North-west?-- Yes.

The position in which it is in, whether it is slow or reading low or anything else to do with it, can have absolutely no possible impact on the performance of monitor point 5; is that right?-- That would be right, yes.

And absolutely no possible impact on the monitor performance of point 16?-- As far as I'm aware, yes.

And likewise points 6 and 7?-- Yes.

5 and 16 are to do with panel 512?-- Yes.

6 and 7 are to do with 5 South?-- Yes.

Even if one threw in point 18, which is 510, in respect of which point 8 can have no possible relevance-----?-- Not as far as I am aware.

In respect of all of those other points I've been mentioning, the slowness or the low reading nature or defect in point 8 has no possible relevance to the performance of all those points?-- Not as far as I'm aware.

The one thing we do know in this Inquiry so far is the explosion didn't happen in 1 North-west near point 8, because the men got out and there is not much damage up there?-- Yes.

Knowing that, it is of no relevance at all, in assessing what happened in this event, to know about how point 8 performed, is it?-- You could assume that, yes.

Now, you were asked some questions by Mr Parkin and he mentioned your knowledge of the fact that 512 had been sealed, and I think he put it to you, or suggested it to you that you didn't know about it until you got to work on Saturday. In fact, on Saturday morning, you were there for a few hours?-- A couple of hours, yes.

In fact, we know it wasn't even commenced to be sealed until the afternoon shift on Saturday?-- Yes.

There is no reason for you to know about it on Saturday?-- No.

You didn't find out about it, in fact, until after the explosion?-- That's right.

But you knew, in fact, before that it was scheduled?-- Yes, it was scheduled for early the next week.

And that had happened on the previous Thursday at a regular scheduling meeting where, amongst others, the undermanager in charge of the electricians and the manager and the - oh, various people from the mine get together and look at the scheduling for the weekend?-- That's right.

You were asked about whether there was, in fact, some sort of written procedure to tell people how to use the Unor system?-- That's right.

There was, in fact, an operating manual, wasn't there?-- Yes.

Do you want to have a closer look at it?-- I can recollect seeing it years ago.

It is a Maihak Australia Computer Operator's Manual and does

it not tell you in some detail precisely how to go about accepting alarms and what sequence to follow?-- It would, yes.

So if someone, even someone who hadn't bothered to show an interest in the procedures before, picked up that document, even if he could read "A" for alarm and looked it up on that page, you could follow a perfect procedure and how to deal with it?-- Yes.

And that was there at the mine, available for anybody?-- It was at the mine. I'm not too sure where it was located.

Now, you mentioned in relation to people who could use the Unor system that it was, in fact, by practice and custom, restricted to people in official capacity; that is to say, undermanagers, some deputies and the electricians?-- Yes.

And that had been for some time the practice and custom?-- Yes.

So, it is just not correct to say that there was no system or procedure in relation to the use of this system, is it? There may not have been things written down in the nice way that Government departments and other people might like, but there was an accepted practice and custom which was followed by the personnel at this mine?-- Yeah, there is no written procedure, but-----

Now, you mentioned in relation to the reportable incidents frequency - you were asked how does your mine - or how does your mine's figures compare with other collieries, and you said you didn't know about them?-- No.

You made a point I think Mr Evans might have made, that you, in fact, adopted a policy of honesty in relation to reporting?-- Yes.

What do you mean by that?-- We weren't too sure and you hear rumours from other mines that not all reportables are reported.

It is a persistent rumour, isn't it, that people like to keep their numbers looking good by not reporting things?-- Yes.

That was not a policy that was followed at No 2, was it?-- Not as far as I am aware. We are very honest.

You were also asked a question by Mr Neilson about directing your attention to Exhibit 90 or 127 - whichever is the one you have - the alarm log - he directed your attention to the alarm at the 512 seal which occurred at 2.31.33 on 7 August and was accepted or acknowledged on the machine at 2.58.21?-- Yes.

As I understood it, he then said to you to look at the next batch of ones that weren't acknowledged until 23 past midnight. As I understood the question: could you assume from that that there was no-one in the room from that period? Did you understand the question that way?-- That it wasn't being

monitored?

Yes?-- Yes.

I see. Now, you said "yes" to that question, but can I ask you this: you weren't there, were you?-- No, that's right.

So, you have no idea who was in the room from time to time or all the time?-- No.

So you, yourself, couldn't draw that assumption?-- No.

Let me tell you extra things. If you knew Mr Blyton had given evidence and said he was in the room on a number of occasions in that period and you knew Mr French had given evidence and he was in the room and actually operated the machinery in that period, and that each of those men had referred to, in combination or otherwise, the fact that Mr Shaw had been in the room and Mr Squires had been in the room, there is no way in the world you could make that assumption, is there?-- No.

In fact, it would be totally contrary to the evidence, wouldn't it?-- Yes.

I have nothing further.

WARDEN: Mr Parkin?

FURTHER EXAMINATION:

MR PARKIN: Mr Robertson, just in answer to the point that was raised by Mr Morrison, did I understand you to say that you did not even know that 512 panel was being sealed - whether that changes any of the answers you gave previously, because that was the intent of my question - was being sealed?-- I knew it was due to be sealed. I didn't know it was being sealed on the Saturday.

No, the very point - the whole point of my question was that the panel was being sealed and you've got extensive knowledge on the Unor system and indeed the gas chromatograph and you didn't know about it?-- That's right, yes.

That's the point I was trying to make. Thank you.

MR CLAIR: Your Worship, I have one question in light of the new material that's been put to Mr Robertson.

FURTHER RE-EXAMINATION:

MR CLAIR: Mr Robertson, as the person basically responsible for the Unor - at least the maintenance of the Unor system - you spent some considerable time in and about that area where the Unor screen was located?-- Only when needed.

But would you have been there more frequently than anybody else, or as frequently as anyone else?-- There's a chance that I may have been in the room more often, yes.

Did you ever see that manual there near the-----?-- I saw the manual years ago when the system was introduced.

But over the years since then, have you seen that manual there near the Unor screen?-- No.

Do you know where it was kept?-- I'm not too sure, no.

Do you know if there was anything directing people's attention to the fact that a manual was available?-- I don't think there was any indication that there was a manual available.

I have no further questions, Your Worship.

WARDEN: Thank you, witness. You may stand down. You are excused.

WITNESS EXCUSED

MR CLAIR: I call Gary Ronald Kunst.

WARDEN: The Court will rise at about 3.15.

GARY RONALD KUNST, SWORN AND EXAMINED:

MR CLAIR: Your full name is Gary Ronald Kunst; is that correct?-- Yes.

And you are a senior foreman/maintenance planner at Moura No 2 Mine?-- Yes.

Mr Kunst, you have worked at Moura No 2 for 19 years, being a foreman for the last six years; is that so?-- Yes.

And recently, in fact, you were made Senior Foreman, Maintenance Planning?-- Yes.

When was that exactly?-- It more or less was in the process of happening. I have been doing the role of sort of maintenance/planner/scheduler for a few months, but hadn't really been relieved of my foreman duties at that stage - until the new fellow has been appointed, so----

How long was it before 7 August last year that you were made senior foreman?-- A couple of weeks.

Okay. Now, you have set out in a statement dated 29 August 1994, which was made really in the course of an interview that took place with some inspectors and in the presence of other people - you have set out in there your knowledge of matters relevant to the questions before the Inquiry here?-- Mmm.

I don't intend to take you right through that statement in detail, but I do just want to touch on a few things in there, you see. First of all, in terms of the general system of maintenance management at the mine you did have some system of defect reporting?-- Yes, we did.

What was the nature of that?-- There was a book form that was made available to all employees to record defects and a collection point. There was also a means of verbally recording defects to the tradesmen in the workshop office. They had been given instructions on a system whereby they took the defect down and it went into the computerised maintenance system then, so it was recorded, sort of thing, and would eventually get attention.

There was some allocation priorities in some way?-- Yeah, well, the leading hands and things like that, if they took the defect they knew how to prioritise it, you know. Other than that, if it just came through the normal collection point I would look at them daily and decide whether they needed attention immediately or just convert them to what we call the work order and go from there.

Now, that was a system to cover defects. Was there also what might be called a preventative system which was basically designed for maintenance design to ensure that defects didn't arise?-- There was systems in place. They did need a large amount of improvement. That was to be my role as maintenance planner and we were working towards setting up proper maintenance strategies, and to do that - there's been systems in place there for years, but they probably weren't quite adequate, you know, and - but with the mobile equipment, things like that, yes, I think our preventative maintenance was up to scratch. They came in very regularly for their services. The production machinery we got at as best we could.

How were records of that kept, that is regular scheduling requirements?-- The mobile equipment was all recorded in the statutory service books. They were all there. The production equipment, just the normal preventative maintenance tasks, we just more or less as required recorded in the report book.

Was there any computerised system in relation to that preventative maintenance?-- Not as far as the scheduling of it goes at this stage there wasn't, but most of it would have been recorded in the computer log towards the end to say that the work had been done.

That was towards the end, during the period immediately prior to 7 August?-- Yeah, the last couple of months leading up, I suppose.

I want to ask you about some specific areas that have come into focus. First of all, was there a system for checking the efficiency of the shuttle car cable reeling systems?-- I introduced a system probably a couple of months before the disaster whereby we did a weekly inspection. That was scheduled in the computer scheduling program and there was

just a check sheet that was given to the tradesmen, and once per week they went and did those tests and that included the testing of the cable rewind device and all its functions, you know, from pressure exerted on the cable to just general inspections of the components.

Sorry, I may have missed this, but how long had that system been in place for that regular weekly inspection?-- Without looking at records I'd say about two months or something like that.

About two months?-- We did do inspections of rewinds before that, but they weren't routine, you know, and it was for that period, I suppose, that they were routine and to a set standard, you know.

Was there any reduction in the incidents of cable flash or cable damage?-- I couldn't really say. I'd only be guessing if I said.

It wasn't a long enough period over which to make any judgment?-- I don't think so, no.

Now, again another area that I'll take you to is this question of the picks on the continuous miners. Who was responsible for ensuring that those picks were kept effective and sharp first of all?-- Well, it was the operator of the machine, if he - he was supposed to do - check those as part of his pre-start checks and things like that on his machine and he was given the tools and things to do those jobs. Tradesmen quite often did the job as well, but there was no reason why it wouldn't be carried out by the miner operators and the other people in the panel.

There was no regular system of inspection -----?-- No, generally they knew when they needed doing, you know, when they were working on the machine.

Can I ask you about the continuous miner that was being used in 5 South section at the time of the explosion or at least that was located there for the purpose of the work that was going on at that time? Were you aware of any defects in that miner that might have had the effect of creating or generating excessive heat?-- No.

Was there a system of regular maintenance on any areas that could create that kind of problem or was that the sort of thing that was reported and attended to?-- I guess probably the latter where things were reported and attended to, but from time to time we did do preventative maintenance tasks on those machines whereby we could do certain checks, you know.

How often was that?-- Well, unfortunately it wasn't a regular thing, but it might - most weekends, for instance, we would have done some maintenance on the machine, you know. We would have said, "This weekend we will look at this part of the machine."

Just on one machine or -----?-- Depending on the number of

people I had available and the availability of the machine.

Now, did you have any knowledge of a brake problem that had been present with that miner?-- It had a brake problem for a couple of days leading up to that, some hydraulic problems, yes.

What was the nature of that?-- It wasn't actually - the brake problem was caused because of a hydraulic pump failure. The brakes being hydraulically released were affected when the hydraulic pump failed and when the pump was replaced there were still some problems because the metal that had been generated from the pump failure went into the hydraulics and caused a few valves to play up and they were subsequently cleaned, replaced and repaired.

When was that relative to 7 August?-- The last time it was worked on was the Saturday.

The sixth?-- The sixth it would have been, yes.

That problem that had been there with the brakes, was that one that had the potential to generate excessive heat?-- Not in my opinion, no.

You've been made aware of the fact that immediately - very shortly before the explosion the electrician in 5 South, Mr Geoff Mazzer, described to Mr Squires on the telephone that there was a noise coming from the pump motor which had delayed production with the continuous miner that was being used there while Mr Mazzer investigated it. Now, do you have any idea what could have caused that kind of problem?-- I'd only be guessing, you know, but noises like that - there is a lot of things that could cause a noise, maybe a cavitation or something, but I couldn't really say.

He apparently described the noise as not loud and it doesn't prevent the operation of the machine. Does that assist in any way?-- Not really.

Can you think of any problem that could be associated with that kind of noise that could have the effect of producing excessive heat?-- No.

Finally, if I can ask you this: immediately after the explosion on the Sunday night you were at the mine; is that right?-- Yes.

Were you there at the time of the explosion?-- No.

But you were there shortly after?-- Yes.

Did you go subsequently, at about 20 past midnight, to check the main fan?-- Yes.

You went with Mr Robertson?-- That's right.

What did you find there?-- I just checked around the fan housing sort of thing and I noticed one of the inspection

doors - explosion doors had been blown off its hinge about three or four metres, I suppose, it was shifted, but that was the only damage I noticed. I checked on top of the fan and all the doors up there were closed.

Were you able to refit the door?-- Yes, the type of hinge it had was one where you just clip it back into place and -----

So it was a door that could be blown off its hinges without any great degree of force being required?-- That's true.

Some might say it was easy enough to get off to the extent that it was easy enough to put back on again?-- That's correct, yeah.

And you checked around and on top of the housing of the fan?-- Yes.

You didn't find any other signs of damage there at all?-- No.

I don't have any further questions of Mr Kunst.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Kunst, just one matter. You've mentioned the maintenance program at the mine and I think you've said that there were two types of maintenance, planned and unplanned?-- Mmm.

The planned maintenance mainly related to what you've termed the mobile equipment?-- There was planned maintenance for the underground production equipment as well, but it wasn't quite as formal. Over the years we had gone through periods of having formalised systems which were sort of wall charts and things like that. They basically sort of fell down and maintenance went back to as we could get it we did it, but I still believe that we were doing the maintenance, I just don't think it was in a very formal sort of an order which was what we were trying to achieve.

Was this the case: you had some planned maintenance or preventative maintenance?-- Yes.

The other type of maintenance you would have would be in response to defect reporting by various operators?-- That's correct.

In an ideal situation you would hope to have a greater proportion of your work as planned maintenance as opposed to -----?-- That's the way we were trying to head, yes.

That's what you meant when you said something like you were working towards proper maintenance strategies?-- Yes.

So you would have a more formal arrangement whereby you could

plan the maintenance more readily?-- Yep.

That was in the process of being developed?-- It was, yeah. We were a little bit behind other areas of the mine due to the fact that we didn't have the staff to accomplish it, you know.

It was something that you were aware of and were dealing with?-- For sure, yeah.

Thank you.

MR MARTIN: I have no questions.

CROSS-EXAMINATION:

MR MORRISON: Mr Kunst, you were involved, I think, in accident investigations in your capacity as a mechanical person?-- Occasionally.

And what sort of things would you be called in to deal with? What sort of investigations is what I mean, not what sort of mechanical faults?-- Accidents in regard to people or machines or what do you mean there?

Well, both?-- I can recall instances where I probably looked at things such as cable faults and things like that, you know, and checked out the rewind mechanisms and things like that after there had been some sort of an incident, but not too many times was I involved in personnel type accidents or anything.

It would be largely in relation to the machinery itself?-- Yeah.

In relation to the cables in particular, cable difficulties, it's the case that the investigations were carried out terribly seriously, weren't they?-- Beg your pardon?

The investigations were carried out very seriously?-- Yes, yep.

In fact at this mine - I don't know how it compares with others, you may know - the actual machinery was stood down and quarantined and production ceased, for instance, in cable flash incidents until a full investigation had been carried out?-- Yep, that's right.

It's not often you see production being sacrificed for safety, is it?-- Well, the management have this attitude that they wanted to try and stamp out these problems and so they took - put a fairly high degree of importance on sourcing the - that's why we brought in the weekly checks on the rewind mechanisms and the defect - the cable incident report sort of thing so that we could try and narrow down what was going wrong and solve the problem.

The weekly checks was a relatively recent innovation?-- Yes.

And I think I understood you to say you had done them before but perhaps not as routinely as weekly?-- That's correct. The checks before were done either as required or part of other routine maintenance on the machine where - when I introduced the weekly checks it was just specific to the cable reeling device.

Now, there is no statutory requirement to make investigations or checks on those things as routinely as weekly, are there?-- Not as far as I know.

This was something peculiar to the maintenance department and management as well?-- It's something that management had asked of me and I agreed with so we went ahead and did it, yes.

The management you referred to before as determined to stamp out the incidents of particularly cable flash, are you talking about Mr Schaus and Mr Mason there?-- Yes.

And the other people in management?-- Everybody was concerned about cable damage at the mine and I think it was high on their list of priorities to do something about it.

But the charge in relation to that extraordinary level of investigation, quarantining the entire machine, not just the cable, actually stopping a panel until a quite formal investigation had gone through involving inspectorate and all the rest, that charge was led by Mr Schaus in respect to that, wasn't it?-- Yes.

He was very determined about that?-- Yes.

Now, you responded to some mechanical aspects of a 512 risk analysis, didn't you?-- Yes.

Arising out of a risk analysis done for the 512 Panel there were a number of components that impacted upon you in your capacity as being in charge of mechanical maintenance?-- That's right.

And from what you could gather, was the risk analysis taken very seriously by those at the mine?-- I wasn't involved in actual risk analysis like sitting in on it.

I understand that?-- I took - was given some instructions to some things that were required to be done from my department which were done. Some of the items I believed, you know, sort of a bit - just peoples whims, I suppose, but then again that was okay by me. There was no problem, we went ahead and made the modifications or whatever as they requested.

In fact from what I understand you to say then you considered that some of the specifications that you were required to perform arising out of the analysis were a little over the top, a little more than was needed?-- Not necessarily. I just

- no, I wouldn't say that.

You referred to them as being "peoples whims"?-- Yeah.

Give me a better idea of what you mean by that?-- Well, when you get a lot of people together I suppose they all get ideas on what they think is right for the machine or whatever, you know, and then they come and tell you that this is what's needed, so whether you believe it or not you go and do it, you know, and a couple of different little things.

The mechanical department certainly, regardless of what they thought about what they were asked to do, responded and did it?-- We certainly did, yes.

Now, in relation to the maintenance department or mechanical maintenance department it's the case, isn't it, that the Moura No 2 had from time to time outside consultants assist them; is that right?-- In the recent - say that again, please?

Is it the case that Moura Mine - when I say Moura Mine, the operator of Moura Mine got in outside consultants to give advice about ways of improving the maintenance and mechanical maintenance?-- That's true.

PA Consultants was one?-- Yes.

They in fact came in - I don't know whether you would call it an audit, what they did - they came in, spent some time at the mine, produced an independent report in relation to the systems?-- That's correct.

And that report was implemented?-- That's true.

And another person that might have been involved was a chap called Mr O'Rourke?-- Yes.

He is an outsider to the mine?-- No, he's -----

He's not?-- He's an internal person working in the open-cut.

In the open-cut?-- Yes.

I tend to regard the mine as being the underground part?-- Sorry, yes.

And in relation to your department - and we talk about in terms of maintenance generally - there was quite a deal of meeting and arrangements and planning done, weren't there?-- Yes.

There were planning meetings with the production managers held daily?-- Yes.

And there were weekend and weekly forward planning meetings held every Thursday?-- Yes.

And you would be there in your capacity as being in charge of mechanical maintenance?-- Yes.

And you would have an input into those planning meetings?-- Yes.

And that was every Thursday, and participating at those would be people such as the manager, the undermanager, the electrical foreman, a number of others?-- That's correct.

At those meetings each department would put forward its various needs for the next period?-- Yes.

And a very detailed discussion would ensue about meeting those needs and planning appropriately in order to get those needs met?-- That's true.

And the meetings were not only treated seriously but the meetings occurred absolutely regularly?-- Yes.

No one time slipped by without that meeting?-- Yeah, the meetings were held, yes.

And those persons attending these meetings would record the substance of what mattered to their department for themselves and go back and implement it?-- That's about right, yes.

Now, you were asked, I think, in the statement by the Inspectorate as to whether you had an idea of what the availability of the production machines was. At that stage you didn't, or at least you said you didn't?-- No, I still really don't know.

Now, we can tell from the May '94 underground mining equipment statistics monthly report that the availability was greater than 90 per cent for all the continuous miner units. Accepting that to be so, it's very high, isn't it?-- It's not too bad, yeah.

Well, "not too bad" might be a typical Australian understatement, isn't it? In excess of 90 per cent for all continuous miner units is a very good result, isn't it?-- I think so.

And in terms of an overall availability rate, that's one to be proud of in the Maintenance Department?-- I felt that we did a fairly good job considering the conditions we had to work around, yes.

In a perfect world - not that we live in it - but in a perfect world it would be nice to have 100 per cent, but it never happens, does it?-- No.

A number of the officials at the mine were involved in considering and implementing matters to do with the Mechanical Department and the mechanical maintenance, isn't that right? People such as George Mason and Albert Schaus were involved in the direct implementation of what you had to do, following it up, making sure it was done, demanding reports and all the rest of it?-- Yes.

And the maintenance that you have described - that is the planned and unplanned - some of the planned maintenance is to satisfy statutory requirements, isn't it?-- Yes.

But you weren't content just to do statutory requirements?-- No, we did a fair bit more than that, to look after the machinery as well as the statutory requirements, yeah.

And was there a particular system that was used to schedule the mechanical maintenance of face equipment, the MIMS system?-- Yeah, the MIMS system is what I was using to schedule the cable rewind checks and the mobile equipment stuff, but the basic -----

The - sorry, you finish?-- The face equipment wasn't on the schedule at that stage, it was still sort of being done manually.

The MIMS system was used for more than just the face equipment, it was used generally?-- It was used for anything that you wanted to put into it as a scheduling tool.

And what does "MIMS" stand for?-- I'm not sure.

Long since forgotten. It's a system which logs and records with some degree of particularity all the aspects of maintenance from defect reports to planned maintenance to unplanned maintenance and so forth?-- It can do, yes.

And then you can track through that MIMS system the reporting of any event, who dealt with it, when, what was done, what the follow-up was and where to find the documentation?-- If you put that much detail into it, yeah.

And the MIMS system was pretty enthusiastically embraced by the Mechanical Department, wasn't it?-- Yeah, we were going very well with it, yeah.

Now, I think in terms of those planning meetings that I referred to earlier, you were the scheduler who attended those planning meetings?-- Yes.

So, you had your own personal contact with all of our departments at the mine and the mine management in relation to the approach to planning and scheduling of maintenance?-- That's correct.

And based on that personal experience, how would you describe the approach of management to all of those matters?-- Quite good. We were in the early stages of it, and there was some improvement, of course, required, but everybody was dedicated to the cause and were trying to get it running as smooth as possible, you know, get a plan in place that we could stick to more or less.

It was a very serious approach taken to it, wasn't it?-- Yes.

Now, in terms of the provisioning of the Mechanical Department, is it right to say that you had available to you quite excellent maintenance facilities?-- Yeah, I think so.

In your experience, very good?-- Yes.

And there was no stinting on your budget?-- Not in the area of maintenance, that's for sure.

And the mine was taking quite large improvement steps and procedures for maintenance, weren't they?-- Yes.

Actively pushing forward the implementation of controls?-- Yes.

Now, there is only one other thing I want to ask you and that may require you to look at a document, I'm not sure. We can see from some of the records in this that have been produced here that on 25 July, that's two weeks before this happened, there was only one fan operational for part of that time. Do you know the reason why that was so?-- No, I can't recall that.

Would it be recorded somewhere?-- I imagine it would be.

Well, you can't directly recall now the reason why that was so?-- No. Possibly an electrical installation or maintenance or something, I wouldn't know.

I have nothing further.

MR HARRISON: No questions, Your Worship.

EXAMINATION:

PROF ROXBOROUGH: Just a quick question, Mr Kunst, if I may. In reply to a question by Mr Clair on the maintenance of cutter picks, you said this matter was up to the operators, that they changed picks as and when required; is that correct?-- Yes.

And I guess that's common practice in most places. However, pick consumption can vary very widely from place to place.

Would you have any idea on a tons per pick basis what pick consumption was at Moura in round figures?-- No, I wouldn't have that, no.

You wouldn't have any idea at all?-- I guess it could be calculated out going through the store systems and things, but I haven't ever done that.

It's just that that could give you a reasonable indication of the sort of abrasivity of the material which you are cutting, propensity of the sparking perhaps, but you wouldn't know whether it was 2 tons a pick or 200 tons a pick?-- No, I would just be having a straight out guess if I said something.

EXAMINATION:

MR ELLICOTT: We have heard reference in evidence to Rovers which are personnel transport used at the mine. Are they in fact all PJB's?-- Yeah, all except for the ambulance vehicle which is a Landrover.

That is what used to be known as a Mine Rover?-- Yes.

It's true that it's mostly PJB's that are now in use?-- That's correct.

Is the ambulance vehicle always kept on the surface?-- Yes.

Thank you.

MR CLAIR: No further questions, Your Worship.

WARDEN: Thank you, witness. Witness, you may stand down, you are excused.

WITNESS EXCUSED

WARDEN: Proceedings are adjourned to Monday morning, 11 a.m.

THE COURT ADJOURNED AT 3.09 P.M. TILL 11 A.M. ON MONDAY, 13 FEBRUARY 1995

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 13/02/95

..DAY 24

THE COURT RESUMED AT 11.30 A.M.

MR CLAIR: May it please Your Worship, I call Jacques Francois Abrahamse.

JACQUES FRANCOIS ABRAHAMSE, SWORN AND EXAMINED:

MR CLAIR: Your full name is Jacques Francois Abrahamse; is that correct?-- That is correct, yes.

Mr Abrahamse, you are a mining engineer employed by BHP Australia Coal at Moura; is that so?-- That is correct, yes.

You graduated in mining engineering from Wollongong University in 1987?-- Yes.

How long a course was that?-- It's a four year course.

After the third year of that course did you join the United Mine Workers and work as a miner at Invincible Colliery in New South Wales?-- That is correct.

And you stayed there for three years; is that right?-- That is correct, yes.

Were you doing your studies part-time then for the balance of your course, or were you able to blend your work with full-time studies?-- No, I worked full-time. They gave me a shift off a week and I completed the studies in the next three years - my last year in the three years, yes.

You, in fact, were retrenched from that job at Invincible Colliery in December 1987?-- Yes.

You worked then on the Bondi sewerage tunnel during 1988?-- 1988, yes, that's correct.

And then you joined BHP Australia Coal at Norwich Park in 1991?-- That is correct.

Were you working in the mining field at all between 1988 and 1991?-- I was at Bondi for six months in 1988. After that I worked as a private contractor, setting up my own business with my brother-in-law, putting down carpets and vinyls.

You weren't in the mining area?-- Not in the mining industry.

Now, you say that you joined BHP on the Graduate Scheme. Can you give us a very brief explanation of what that is?-- The Graduate Scheme is set up by BHP to obtain people that are fresh out of university and they are rotated through two operations in their two year period. It's a sort of a learning experience, if you can call it that, yes, in the

industry.

And it is, in effect, a set program for two years?-- Yes, yes. It is an established program, yes.

For the first year of that you were working principally as the drill and blast engineer at Norwich Park?-- That is correct, yes.

And you had some relief duties as a foreman?-- Yes.

What sort of mine was Norwich Park?-- Norwich Park was an open-cut operation.

You started then at Moura No 2 in February of 1992 and you have remained there since that time?-- That is correct, yes.

So that, in effect, you were half-way through the Graduate Scheme at the time you started at Moura?-- That is correct.

Was this, in effect, the second phase of the two operations that they would put you through as part of that scheme?-- That is correct.

So that when you started at Moura No 2, what, in effect, was your position there?-- There had not been a full-time mining engineer stationed at the No 2 underground. There was a gentleman that was part-time at the open-cut, part-time at the underground, so when I was placed at the underground there was a - quite a wide scope of duties or responsibilities that I had taken up.

You were still on this Graduate Scheme?-- Still on the Graduate Scheme.

Were you simply referred to as-----?-- A graduate mining engineer.

Graduate mining engineer?-- That is correct.

You didn't have any designated position in the mining structure?-- No, as a graduate mining engineer you are paid out of Brisbane, so you are not basically on the Moura lease books.

The idea was during that year then that you were supposed to be on a learning curve-----?-- Yes.

-----as you put it. First of all, was the mining engineer who had previously been looking after the open-cut and the underground still there and involved with the underground side of things during your graduate year there - graduate engineer's year there?-- He was on site for a period of about three months - three to four months, and then left the Moura mine.

At the beginning of the year?-- Well, he was there for three months while I was there.

He was there for three months at the beginning of the year?-- That's correct.

What proportion of his time did he spend at the underground?-- Well, he didn't really. I tried to liaise with him at the open-cut. The underground and open-cut are a distance apart. I stationed myself at the underground.

I see. Well, what extent of contact would you have had with him over that three months?-- On a weekly basis I would try to get to see him at least once to twice a week for a period of time.

I should ask you then, how long would you get to see him - this once or twice a week? I gather from what you say he wasn't easy to catch?-- No, he was a very busy gentleman, yes.

So, how long would you get to see him when you did catch him?-- For a couple of hours. He had some scheduling spread sheets that he had up and running. He had sort of told me a few of the ideas that he and Phil Reed had discussed and were up and running and he also had done some investigative work on pillar stability that he was getting me up to speed on. He also had a lot of information - literature information in his office that I then took for my own sort of education.

To keep at the underground?-- To keep at the underground, yes.

Well, perhaps I should ask you this, then: who did you feel you did your learning from or how did you go about doing your learning during that year of graduate school?-- Most of my learning, from an operational point of view, was from Phil Reed and George Mason at the underground.

They were the people based there that you saw, I suppose?-- Five days a week.

If not on a daily basis, at least regularly?-- Every day.

But no contact with the mining engineering kind?-- No.

Other than that?-- No, not that frequently, no.

As an engineer there then, and under the Graduate Scheme, what sort of things did you do?-- One of the first tasks that I was asked to perform was to - was based on - the BHP group were introducing a continuous improvement program, part of their Quality Assurance system. I came up to speed with different tools and techniques in identifying problems or limitations. Once I got up to speed with that with Phil Reed, I then started analysing areas that were productivity down-times at the No 2 underground.

So that was really - this program of continuous improvement was really with a view to enhancing methods and production?-- The continuous - yes, that's correct, it was a - utilising tools and techniques for collating data and then analysing

data.

To see where things were headed - when you talk about continuous improvement, to see what sort of production there was and what sort of systems could be improved?-- That is correct, yes.

Was there a safety aspect to that? Was there a specific safety aspect to this continuous improvement?-- Yes, obviously production and safety work hand in hand, yes.

But under the continuous improvement program, was there a specific area designated as safety considerations, or that sort of-----?-- Yes, if you talk about - one of the items that I had identified was high methane level makes or methane levels while development was occurring. That effectively stopped production, and that is a safety aspect, yes, so production and safety work hand in hand.

So, where there was that interaction between safety consideration and production, it came into focus?-- Yes, yes.

But there was no specific area that was designated as safety considerations?-- No, no, there was a safety training officer at that stage, Bruce Danvers. He was basically looking after that.

What other areas then? You mentioned a continuous improvement program, and you have explained what that is. Planning?-- Yes, significant planning on a more realistic scale - being involved with the day-to-day operations, living at the underground. It is the only way to understand the limitations that the operation has to comply with, and then plan according to that where the mine can go in the next six months, 12 months, and so on.

Other areas? This is when you were still on the Graduate Scheme. Ventilation?-- There was a report put out by the ventilation - by the previous graduate engineer that was at the mine. Mr Reed asked him to identify some ventilation problems in the pit. He wrote a couple of pages, like a little report. From that report we then discussed what we could do - what possible things we could do, and that's when I became involved. There was money allocated in the budget for consultants to come in and that's what I got involved with - choosing somebody or some consultancy to assist us with the mine ventilation aspect of the No 2 underground.

This was during 1992 while you were still on the Graduate Scheme?-- That is correct.

Did that consultancy work then proceed?-- It did proceed, yes.

And who did that?-- The International Mining Consultants - a gentleman by the name of Andrew Selff.

That's the report that's been mentioned here in evidence?-- That's correct.

What about actual panel design? Did you have any involvement with that under the Graduate Scheme?-- Yes, the work that Carl Pritchard, the mining engineer that was there previous - the work that he had conducted, I had just basically followed on. We were looking at determining safety factors on remnant pillars, because we were a partial extraction system, and using empirical formulas to determine safety value calculations.

Well, I gather from what you say you didn't have a lot of time during the few months that he was available to talk to him about that. How did you go about enhancing your knowledge of those - or of the problems associated with panel pillar-----?-- He did quite a considerable report on back analysing information at No 2 underground and he used that with different empirical formulas to analyse what actually had occurred over the last 20-odd years at No 2.

Now, those areas that you have mentioned - planning, continuous improvement area, ventilation work and the panel pillar design-----?-- And gas drainage.

-----to what extent had you had experience with those areas before you started at Moura under the Graduate Scheme?-- Other than my work that I'd done at university and very practical knowledge working at the face at Lithgow, the technical aspect of it I was - that's why I was on the graduate program, to learn about those specific aspects.

The work that you had done at university was essentially theory, I guess, from what you say?-- That's correct. Wollongong was a very practical mining university. You learnt a lot of good practical techniques at Wollongong, yes.

What about your time at Invincible Colliery at the face? Did you get involved in questions of ventilation methods or pillar design, or gas drainage?-- At Invincible Colliery, as part of my degree, I submitted a thesis on strata control of longwall gateroads. The mining engineer at the time at Invincible was Angus Webster. I assisted him with some of the data - obtaining some of the data - and I was able to use some of that data in my thesis that I presented to the university.

After you finished your year under the Graduate Scheme, you were appointed as Underground Mining Engineer at Moura No 2?-- That is correct.

And you were, in effect, as far as you knew, the first full-time mining engineer that had been appointed there then; is that what I understood you to say?-- That's correct, since the '86 No 4.

'86?-- That's correct.

Did your responsibilities extend only to No 2, or did you have some wider responsibilities?-- Only No 2. There were projects that - I mean, No 4 affected No 2 in some regards, but generally No 4 wasn't an operable mine.

Now, when you were appointed as the underground mining engineer, was there a specific set of duties that were attached to that position?-- No, there wasn't anything written down as specific duties, no.

At some later stage?-- Yes.

There was some list of duties devised?-- Yes, once I became a permanent engineer, as part of the Quality Assurance system, I was heavily involved in writing up individuals' position descriptions.

So that was a process you had involvement with yourself?-- That is correct.

Perhaps the witness should look at Exhibit 12, Your Worship.

It is about page 7 or 8, I think, Mr Abrahamse - page 8. Have you found the first page - the cover page? That's it. That's the document that sets out the position description for Underground Mining Engineer?-- That is correct.

Now, just before I go to the details of that, when the responsibilities set out in this document were listed did it reflect what you had been doing before that?-- To some - yes, to some degree, yes.

Just to some degree or entirely? I'm really just wondering whether we can use this, you see, as an indication as to what your responsibilities were as from the time of appointment or whether the responsibilities broadened or changed in some way when these were listed here?-- When these were listed in August they were what I was doing at that particular time, yes, that's correct, yes.

And had that varied much from the beginning of the year?-- It had grown to some degree, yes.

Perhaps -----?-- I'd like to just clarify something, while on the Graduate Scheme I was only there officially for the one year. It wasn't that I was going to be guaranteed to be there in '93. It wasn't - when I came to Moura I had - I was under the impression that I would get changed to another operation. Phil Reed, the manager No 2 at that time, really requested that he had a full-time engineer. Because I was on site at the time I was placed in that position.

And it was that that led to your appointment -----?-- That is correct.

----- in '93?-- That is correct.

Because you were there he said, "We need a full-time engineer and I've got one on the spot."?-- "I've got one on the spot.", that's correct.

So a position was created -----?-- That is correct, yes.

----- to accommodate you. I'm really interested in establishing the duties of that position at the time you started in it, I guess. So can you do that by reference to this position description or would you prefer to do it otherwise?-- No, we can go through point by point -----

You might just mention those responsibilities that weren't attached to the position at the beginning of the year if you think -----?-- That were not?

That were not attached, yeah. Just single them out as we go through, but the first of the responsibilities on that Exhibit 12 is to develop and implement short-term and long-term - short-term being monthly and long-term being one to three year - mine plans to achieve production targets and schedules for the underground operation?-- I was more involved with the short-term operation at the graduate stage, yes.

But when you took the position on -----?-- As the year grew on.

----- as underground mining engineering -----?-- Yes.

----- you were expected to do this production scheduling; is that so?-- That's correct.

Initially you say it was more in the short-term area than the long-term?-- That's correct.

The second responsibility laid out there is to liaise with the geology department to ensure that coal reserves and methane gas quantities are explored ahead of mining. That was one of the responsibilities attached to the position when you took it on?-- No, that grew, obviously, as your long-term planning increased and my involvement with the methane drainage program increased.

But did the position have those responsibilities associated with -----?-- I did as a mining engineer. I would relate to the geologist and I did relate to him with regards coal quality and areas that we could - we could and we would develop towards, yes.

Tell me, had you had experience before coming to Moura with what might be called gassy coal?-- No, I didn't at all actually. I was aware of gas drainage operations coming from Wollongong in the Appin Colliery area, Westcliff area, yes, but other than this honours from a - university based skills.

So the experience that you had in that area was really what you gained at Moura?-- That is correct, yes.

Now, the third responsibility mentioned is to ensure bord and pillar panel designs are practical and workable. So that's really the panel design aspect that you looked after as a graduate and then took on as a mining engineer?-- It wasn't my sole responsibility. As a graduate I liaised with George and Phil with regards what they had done before, yes.

When you became the engineer, the underground mining engineer, were you expected to assume more responsibility in that regard?-- Yes.

To assist the underground superintendent with the preparation of reports, budget justifications and other matters as required?-- The preparation of reports as a graduate engineer, yes. Budget justifications was another task that just grew as the year went on.

After you became an underground mining engineer?-- Well, budget justifications are completed at the end of every year, middle fiscal year, and I was at the underground at that Christmas period so, yes, I had involvement with the following year.

Just harking back to the panel design aspect, had you had any experience with bord and pillar mining before you came to Moura?-- I had - on a practical level?

On a practical level?-- Yes, I worked at Newvale No 2 Colliery in a bord and pillar operation for a three month period during my second year out of university. That was

Christmas vacation work, and then when we started at Invincible I was predominantly in the main dips which was a five heading system, bord and pillar operation.

Number 5 there in the list of responsibilities is to undertake project work and ensure work is conducted safely, effectively and efficiently. In long-term planning projects he must allow for the adoption of new mining techniques for greater productivity with safety. Now, that was conceived as part of the job in August, but had it been part of your job as an underground mining engineer?-- That's a very, very broad statement. It covers quite a considerable amount of things. Project work was based on the likes of construction of a 250,000 litre water supply tank to evaluation on new machinery to ventilation surveys. There were all - I mean it's a pretty - number 5 is a very broad sort of sentence.

A whole range of projects, you say, and what about this aspect of adoption of new mining techniques? Was that an area where you had to take any particular steps to keep abreast of what was happening?-- As a mining engineer you would always, but when I was introduced as the graduate engineer I wasn't there to change any systems that were already in place and that were already working very well, yes.

But as time went on -----?-- As time went on there were - you know, if there was an ability to refine it, yes, to look at those, to evaluate those systems.

Number 6 over the page is to assist with the supervision of the in-seam gas drainage operation. You've already touched on that?-- Yes. That grew as - once I was appointed.

Number 7 is to assist the ventilation officer with mine ventilation requirements and modelling for future mine panel designs. Now, the ventilation officer was a specific position within the mine; is that right?-- That is correct.

In terms of the chain of command was that position subject to your direction or -----?-- No, it wasn't.

Was it in a different run of -----?-- No, the ventilation officer reported to George or the mine manager.

But you had a specific role in assisting the ventilation officer?-- We worked in the same office, close quarters, yes.

That was an area that you did become fairly closely involved with in your role as a mining engineer there?-- Not really. I looked after long-term mine ventilation scenarios, but I did not look after day-to-day situations. I helped Alan - Allan Morieson formalise his role, but I didn't have - I didn't have any sort of decision making scenarios with him on a day-to-day basis, no.

From your position as the mining engineer, who did you regard as having those decision making responsibilities on the ventilation front?-- Well, there weren't very many people to choose from there. There was the manager, undermanager in

charge or the undermanagers. Yes, they were in control of operations on a day-to-day basis.

So as you saw it, from where you sat, the chain of command in respect of ventilation and any difficulties associated with that went from the ventilation officer through the undermanagers to the manager?-- That is correct, yes.

Now, the next duty listed there is to liaise with the underground reporting clerk to ensure that the underground recording and recording system efficiently reports to senior management. Now, can I ask you this first of all: who was the underground reporting clerk?-- The gentleman's name was Mr John Eccles. He was a production and maintenance clerk and he would collate the production and downtime records on a shift-by-shift basis. That's really what that was. It was a recording of production tonnages, shifts worked and respective downtimes on different pieces of machinery.

So are you saying that the reference to ensuring that the "underground recording and recording system efficiently reports" was restricted to production reports?-- That is correct.

Not to reports about what was happening underground in terms of any safety matters or incidents?-- No, it was purely production.

Purely production?-- Purely production.

The next is to supervise and train other engineers, graduates and undergraduates in underground operations and projects. I don't know that that one came into focus at any time?-- During the Christmas period we often gained a couple of willing helpers to do certain projects. At one stage we had three gentlemen come from Papua New Guinea that were starting at the University of Papua New Guinea, undergraduates, yes.

Number 10 is to maintain daily contact with the underground operations of the mine?-- That is correct.

Pretty broad one again, but nevertheless -----?-- We lived in the same quarters. We were right next door to one another, yes.

That cast a fairly broad set of general responsibilities -----?-- That is correct.

----- in a sense on your shoulders to make sure you knew what was happening in all areas in terms of the underground operation?-- That is correct.

Finally, work in and promotion of continuous improvement; that was an extension of the program you were talking about earlier?-- That is correct, yes.

I see in terms of the authority paragraph there it says the mining engineer has the authority necessary to identify and suggest improvements for any issue relating to the day-to-day

activities as contained in this document. He has authority to make recommendations on the preceding technical areas?-- That is correct.

You saw your role clearly in that way, that you -----?-- Yes, a bit of both by August, yes.

"During the absence of the mining engineer all responsibilities and authorities shall be delegated to a person nominated by the underground superintendent." Now, was there any time during that period, say, between April and August of last year that you were absent for any particular time?-- General annual leave, yes.

When was that?-- I had four weeks off in the June/July last year and there were Christmas periods that I would try to get away, yes.

When you say June/July can you be any more specific than that?-- 16 June to 11 July. That was about three and a half weeks.

Who was nominated by the underground superintendent as carrying your responsibilities during that time?-- Well, at that stage it would have either been himself or George Mason. There wasn't anyone to delegate those sort of jobs to.

So there wasn't anything done prior to your going on leave whereby you, in effect, handed over your responsibilities or current files or current programs to anyone?-- No, no. Albert, George - Albert Schaus, George Mason and myself worked together as a team in evaluating 24-hour stuff, monthly stuff, so when I went away or when he went away the three - either two of the three were available to carry on projects.

The imparting of any knowledge you had was really by way of informal sort of contact rather than any formal handing over, I suppose?-- No, there was no formal handing over, no.

It was more by way of informal contact. You say you were in contact, the three of you, day-to-day in any event?-- That is correct that's correct.

Let me ask you this: when you took on the position of underground mining engineer at the beginning of 1993 how did you feel about that yourself? Did you feel qualified and sufficiently experienced to take on what was really a fairly onerous set of responsibilities?-- Yes, it was, but I was very glad to get away from the open-cut. My - I enjoy the underground and that is the field that I wanted to pursue. At that time BHP only had one underground operation and I was sort of privileged to be in that spot, so I wasn't going to question it.

I'm sure you wouldn't have questioned it, but at that stage you really had, by way of experience, your three years underground plus the year of graduate engineer experience at Moura. When I say three years underground that was as a miner; is that so?-- That is correct, yes.

And that was the extent of your actual experience as such. No doubt from a theory point of view you had covered most areas in the course of your studies and in your graduate year, but did you find at times that perhaps you would have liked to have had more experience as a mining engineer before taking on -----?-- It was a steep learning curve, yes, yes, it was.

Perhaps if I can finish that question, before taking on what was really a significant position in terms of mining engineering in respect of Moura No 2. Did you feel at times you would have liked to have had more experience before taking it on?-- Yes, I would, as anyone would like to have had more experience in taking on any particular job, but you've got to start somewhere, don't you?

Well, that's true. Can I ask you this: was there any time when you felt that the range of duties was perhaps a bit broad, a big ask for someone who was only relatively recently graduated?-- Yes, there were a lot of big asks, but I had no problem in trying to broaden my own horizon. I was very fortunate to have - to be at an operation where my role was so diverse where I had the ability to look after some people and also look at a lot of technical aspects and work with consultants. Sometimes too many engineers just get stuck in specific roles and I'm - I personally feel I am an operations person and I felt comfortable with that even though it was a tall ask in some aspects, yes.

You felt comfortable covering the broad range?-- There were a lot of times when we required consultants to come in and actually assist us and that's what we did at Moura No 2, yes, in all other aspects from ventilation to gas drainage to pillar design.

In terms of the ventilation - or at least the methane drainage project, you did have a geologist on site there that you worked with?-- That is correct, yes.

You mention that consultants were brought in; was there ever any reluctance on the part of management to get consultants involved if you thought it was needed?-- No, there wasn't, no.

Those you have mentioned include ACIRL doing the geotechnical evaluations in the panel design?-- That's correct.

Ray Williams of Geogas who did a detailed audit of the drainage systems and procedures?-- That is correct.

And International Mining Consultants whom you mentioned previously as doing a detailed ventilation pressure quantity survey?-- That is correct.

Now, there was some program in place which you mention in your statement for the upgrading of some of the equipment that was being used; is that so, the directional surveying equipment for the methane drainage?-- That is correct.

And that program opened up the prospect of being able to drain further ahead because you could drill longer holes; is that right, longer boreholes?-- That is correct.

And that was all part of a program to look at the introduction of new equipment and better equipment; is that right?-- Yes, that - a better directional drilling system, yes. That was one aspect of it, yes.

And what about in terms of replacement of the coal winning equipment and other new equipment, was there some feasibility study done on that by yourself and George Mason and Albert Schaus?-- In the last eight to nine months leading up to the explosion we had worked - I had done quite a considerable amount of work trying to justify a substantial capital income or capital expenditure system into No 2 underground, yes.

Was there a concern, or at least a consciousness in the background when you were looking at new equipment and in particular trying to justify additional capital expenditure - was there a consciousness of production and keeping production levels up?-- That's the name of the game, yes.

And to what extent did that play a role in decisions that were made by management, including yourself, within the mine? I mean, was it something that was always there, "We have got to make sure we keep production levels up.", or was it just a feature that had to be considered along with many other features?-- The name of the game is winning coal. We did it the safest way we could and that was one aspect. A lot of the machinery had reached its life, we had machinery that was quite outdated, and if we were going to sustain a certain production level, we were looking at new techniques and new mining - new machinery systems that the mining industry had, yes.

How was the matter of production levels approached? Was it a case of looking historically at what had been achieved and then aiming in some way to better that by some fixed percentage or suggested percentage, or was it a case of looking at the whole operation and saying, "Well, we should be able to achieve such and such in light of this and this and this factor."?-- When I started at the underground, the engineer before had a rate of production that he scheduled to achieve a target, a development rate of 450 tonnes a unit shift and on extraction 600 tonnes a unit shift. I do not know how he came about that, but I wasn't there to question that initially. I then set up a sort of a data collating system to actually evaluate what we were getting on development in the truest sense and on extraction and then using that data in the spread sheeting system and scheduling to say, "Yes, this is what we can do." That's the way I approached my scheduling, but you obviously need a period - a good period of time to collate that information.

So, you were really looking at what was being done and aiming at maintaining that or improving on it?-- Maintaining that at least and improving that, that's correct.

Well now, what about amongst the miners themselves? As far as you could ascertain, was there a consciousness of the amount of production on each shift? Obviously there was some inducement to miners to keep production up because there was a shift bonus; is that right?-- That is correct, yes.

We have heard of the shift bonus whereby there is a certain rate per tonne that's paid to the men according to what's been produced on the shift?-- Yes, it's a nationwide coal industry system, yes.

Well, as I say, from your observation of things, was this a big factor with the miners or was it just one of those things that may be of some importance to some but not to others?-- No, it was an important factor. I mean, it made quite a constable difference to people's wages, but historically, you know, there was - there were a lot of times when there was no bonus achieved and other times when we got - you know, we were able to get more bonus, and that was especially on extraction.

Did the bonus run right through or was it just the miners?-- No, everybody is part of that.

Everybody would be part of the bonus system?-- Yes, that's right, all staff at the underground and wages, yes, and at the open-cut they run the same system too.

Well, again, what was your perception? Was the pressure created by having a bonus something which sometimes caused people to cut corners in order to produce more coal? I would like your honest assessment of the situation?-- I would be wrong to say -----

I don't mean literally cutting corners, perhaps I should say. I use that only as an expression?-- The boys knew that the more bonus they got - the more coal they got, if in extraction, the more dollars they had at the end of the shift, yes. There was a - that's the aim of a bonus incentive scheme, isn't it?

Yes, that's right?-- It's part of the industry, yes.

But from your perception of things, was there an inclination at times for corners to be cut in order to achieve a greater production?-- No, I don't think safety corners would have been deliberately cut. To some aspects sometimes different operators were a little bit more game, if you can call it that, and would try a few more things, you know, maybe stay in areas a little lit longer than they should have, but they wouldn't, you know, endanger themselves if they knew that the area was dangerous.

Well, given the natural inclination of people to try and do a bit better and do it in the easiest way possible, there is

that temptation there - let me put this to you: for instance, in an area where extraction is being carried out, there might be a temptation to take a bit more off the pillars than the design of the panel catered for?-- That is correct, yes.

And that's an easy way to get it out because you don't have to move about so much?-- Because you are there, that is correct.

Was there a system in place within the mine to make sure that that sort of thing didn't happen?-- Yes, there was. At the beginning of every extraction panel there would be meetings held where a specific limit was placed on how far the miner would actually go into respective punches, and in the case of 512 how far they would go down in their ramping. The deputies and all the lads were very well aware of that. You then had the undermanagers that were also aware of it and would enforce it while they were underground. The deputies would have been - that were on site would be aware of it and they wouldn't expose the boys to major - you know, major hazards.

Was there a progressive plan kept as the extraction proceeded showing how much had come out of particular pillars?-- On a weekly basis, yes.

On a weekly basis. Were you ever aware of anomalies where too much had been shaved off pillars?-- One particular instance in the 512 Panel where the lads were asked just to rib strip certain - the 13 cross-cut area and they were asked specifically not to take any bottoms in the cut-throughs themselves, just in the punches. They didn't do that, and it was brought to the attention of Albert, Albert Schaus, and he then proceeded to call them into the training room, each 512 crew on every day, and, you know, just basically point out again what he had asked them not to do.

So, it was one thing -----?-- That was one specific instance, yes.

This was one instance, but it was one thing where at least there was some attempt to supervise what was happening?-- Yes, to identify that something that had asked not to be done had been done contrary to what Albert had asked, and he took action accordingly.

Now, what about when the departmental inspector or inspectors came to the mine, did they ever identify that sort of thing where too much coal was being taken out, to your knowledge, and say a few words about that?-- No, not that anyone said anything directly to me, no.

You are not aware of any?-- No, I am not aware of those circumstances.

You were familiar with the various undermanagers that were working at the mine?-- That is correct, yes.

Did you notice any difference in the extent to which they might exercise control over what was happening on their shifts

in terms of discipline in making sure that there wasn't too much coal taken out or any other short-cuts that might be taken? Did you find there was natural variation -----?-- Yes, that's a human instinct, depending on how you convey yourself as an undermanager to the different crews, yes, and which deputies you were talking to or which deputies you had in the section, that's correct.

Well, there are some undermanagers that tended to keep tighter control over what was happening than others; is that your assessment?-- I can't say - put any specifics on that, but I wasn't aware of any instances where undermanagers pulled up deputies or did chat to them, you know. I can't honestly answer that, no. I know it was a human - from a human instinct basis, but no specific incidences.

Were there any particular undermanagers on whose shifts there was consistently higher production?-- If I remember correctly, doggie were the most consistent - dog-watch crew were the most consistent tonnes-wise, yes.

In terms of higher production?-- Yes, and not only high production but continuous production, yes.

Continuous production?-- Yes.

You mean that they had fewer downtimes?-- That's correct. Not just downtimes, they just didn't seem to have that many interruptions. I don't know if that's the right - if that's the correct word. They just seemed to have performed better on an average per week, per month basis.

You were involved with the planning and in particular the production scheduling, etc?-- That's correct.

Did you ever particularly seek to ascertain why it was that one shift seemed to be turning in higher production than the rest?-- No, I didn't. I didn't - I had never analysed that specific aspect, but I remember going to a lot of seminars and the same sort of consistent report coming up, you know. I don't know if fellas on doggie that are permanent dog-watch - day and afternoon rotated - there was a permanent dog-watch crew - whether they just had developed their own systems, you know, for cutting coal.

Was there a particular undermanager who used to look after them?-- At that stage it was Terry Atkinson, yes.

Anyway, you didn't -----?-- I didn't specifically -----

----- take any steps to find out just what it might have been that caused one watch to be - one shift to be consistently producing more coal?-- There were a lot of other things to do.

Now, I want to ask you a question about the state of your knowledge really when you started in the job as underground mining engineer in respect of spontaneous combustion. It may be a bit difficult for you to cast your mind back,

particularly given that you have heard a lot recently and a lot before that, but what sort of knowledge did you have at the time you started as underground mining engineer at the beginning of '93 of problems associated with spontaneous combustion?-- The start of '93?

Yes?-- The little bit of history that I did have prior to starting at Moura was - other than the university, we did a subject on mine gases, very much a theoretical based analysis of mine gases, nothing specifically that related to - that I can remember and I can recall relating to spontaneous combustion. The other thing is when I was at Newvale there was a safety training officer - I did not know his name, his nickname was Pommer - as an induction and being in a spontaneous combustion area in the Newcastle area, he just highlighted a few problems that he had encountered in his lifetime in the Newcastle area and just general symptoms and then how they dealt with it.

General symptoms, what -----?-- Just - he basically - he didn't give us a lecture on spontaneous combustion as such; it was just the way they went down, they felt and, you know, described what actually happened down there, the classic symptoms of sweaty coal, and then the heat - in the specific case that he gave he talked about feeling the heat on the pillar itself, you could feel that the pillar was - the pillar was warm, or specific parts of the pillar was warm, and then how they effectively dug that out and grounded it up. It was more of a story telling incident than a lecture as such.

It wasn't designed to say, "Look, spontaneous combustion occurs because of this, this, this and this."?-- No.

"And the signs you look for are 1, 2, 3, 4."?-- No.

Well, beyond that what you have told us -----?-- Yes, then I did start - when I started in '92, Mr Reed was gracious enough to - while I was on the Graduate Scheme to put me through the Mines Rescue two week course, and I had completed that in the '92 year.

During the '92 year?-- Yes.

When you started then at the beginning of '93 -----?-- Yes.

----- what was your belief as to what you should look for in order to determine whether there was a heating problem in the panel?-- The CO make was what was predominantly discussed at Mines Rescue, and then during the year that I was there I would walk around quite - to quite a number of different places in the operation with Allan Morieson and he would - we would, you know - I would assist with the taking of the Drager tube readings and things like that when he did his weekly CO makes.

I see. What other sort of symptoms then did you believe you should be looking for, or should at least take notice of?-- The main one that was a topic of conversation was regards smell. Again, in general conversation when you would talk to

Mines Rescue people at Moura that had experienced such an event and had - and were called to other fires in the general area, the smell was - yeah, you know, the tarry smell, "You will notice this tarry smell." As a new person on the Brigade you weren't there to question, you were just there to listen and ask a few questions, you know, "You will know it when you smell it.", you know, "You will know it when you smell it."

What about the Graham's Ratio? Was that something that you were conscious of at that time?-- No, I wasn't.

When did you become conscious of that as a feature to look at, at least, in relation to spontaneous combustion?-- Post the explosion - to a greater degree, post the explosion, yes. I understood that it was on the chromatograph - I beg your pardon, on the Unor - but I never really - if I ask myself honestly, I never really took much notice of the Graham's Ratio, no.

Did you know why it was on the Unor?-- No, I didn't ask.

What you have said is that you really regarded the CO make as the important factor?-- That was what was being conducted at the underground, yes.

Now, I want to take you directly to the history of the 512 panel and your involvement with the monitoring of that panel from the outset. I take it you had some involvement then in the design of the panel - I mean, you have mentioned that consultants were involved, but you had some involvement in the design of the panel?-- That's correct.

What was the extent of that involvement?-- Basically four way discussions between Bernard Madden, Albert Schaus, George Mason and myself. We would sit and we would discuss different aspects of what we were trying to achieve.

And did it take some time to conceive the panel design?-- The final-----

It happened over - yes, the final design?-- Yes, considerable time, yes.

So there would have been a whole series of meetings leading up to it?-- Yes, there were a number of meetings. There was also preliminary work that I had done for Albert prior to Bernard coming in, yes - different options, yes.

It wasn't as though ACIRL got all the details and came back with the panel design and said, "This is the way to go.", and all the rest of it?-- No, we discussed a lot of the aspects together.

Was there discussion about the difficulties, if any, in ventilation using the design of the panel that was settled on eventually?-- No, there wasn't actually. There was none at all.

We have heard reference to the compartment pillars splitting the air flow and perhaps the existence of dead spots at some points in respect of the pillars, either behind the pillars or in association with the pillars after they had been extracted. Were they the sorts of things that were addressed in discussions?-- No.

Or was it mainly a question of the load-bearing capacity of the pillar remains?-- That's correct.

And roof structure, safety, essentially matters concerned more with strata and ultimate structure, rather than ventilation?-- And mining systems, that's correct.

And mining systems?-- That's correct.

The desire being to get out the coal as efficiently as possible?-- Yes.

That is, to get out as much as possible and for the least expense I suppose is the best way to put it; is that right?-- That's right, and safely.

And to do it with a view to safety, in so far as the structures were concerned?-- Yes, that's right - local structures.

Local structures?-- Mmm.

The question of ventilation was never addressed at that point?-- No, it wasn't, no.

As far as you know, it wasn't addressed by ACIRL?-- No, it wasn't.

Did it arise as a concern or a question at some stage after the panel had been designed and commenced?-- There are a number of steps that lead up to the - with regards the ventilation, we had - in February we had completed the overcasts that were going to improve the quantity of air that was going to run right throughout the panel. So, prior to February, we were ventilating the 512 panel using flanking returns and effectively closed down the 510 panel completely.

I don't understand what you mean by that. Prior to February - in terms of the actual design, you mean? When did the development of the panel commence?-- I think it was November. Just one moment, I can find out for you.

Yes, by all means?-- Yes, we had three shifts starting in October, but November we started developing 512 - in November.

At that stage, of course, the whole panel had been designed?-- That is correct.

It was known how you were going to develop it and extract it at that point?-- That is correct.

Up to that point there had been no question of any difficulty with ventilation as a result of the design?-- No.

You say that prior to February there was a system of ventilation whereby 510 was being closed off?-- Sorry, "closed off" is the wrong word. 512 bottom return ventilated the 510 - the return air went all the way round the bottom of 510. We effectively closed the 510 section to any drilling. That's what I meant by "closed off".

I see what you mean. The return air - I mean, the air was going first of all to 512, then it was going to 510?-- Yes, and then out to the fans, that's correct.

That was with overcasts that were built in association with the junction point of 512 and 510?-- No, no, the overcasts that have been made reference to in the International Mining Consultants' report in the 1 North-west, at 6 South.

I see. Talking about further outbye?-- That's correct, yes.

Now, there was some change, then, that occurred in February to the ventilation?-- The introduction of those overcasts increased the workload - decreased the workload on the fan and improved the quantity of air we had running through the entire mine, yes.

And what was decided then?-- We had then the ability to ventilate the 510 panel as another air split so that we can continue drilling in that panel.

And what about in respect of 512? What effect did that have on the quantity of air going through 512?-- It improved the quantity quite considerably, yes.

Well, at that stage, it was still in the development phase?-- That is correct.

Was there any question addressed then about possible dead spots that might occur as a result of these compartment pillars?-- No, the dead spots weren't addressed. No-one had brought it to my attention.

Well, then, things proceeded and extraction started?-- That is correct.

And was there any specific aspect of the ventilation addressed at that point - as far as the design of the pillars, effect of the compartment pillars?-- No, it was not - an issue like that was not raised with me.

The very large areas that were created within the goaf as a result of this design, was that a feature that was discussed at any time - in terms of any difficulties in ventilating those areas?-- Not in terms of ventilating, no, not at all, no. The only clarification I'll make on that is because they were large pillars - they were 45 by 47 metre centre pillars - during the development stage of those pillars - but we used brattice - brattice line - and they were - brattice line at 100 metres is getting pretty close to the total length that you really want to use using brattice. You can go further. It has been known to go further - but that would be the only ventilation problem during development - the fact that the deputies and the miners would have had to have done a lot more - a lot more good bag work to make sure that they had good quantities of air to remove the dust from the face.

Then, of course, as extraction proceeded, it did create these fairly large areas within the goaf; is that right - larger

than might have existed in other panels where there was not so much taken out of the pillars?-- Sorry, I don't understand your question.

I was just saying as extraction proceeded, the method of extraction created quite large areas within the goaf - larger than might have existed if you look at other extracted panels on the plan where there wasn't so much taken off the pillars on extraction. Is that a fair comment, or you disagree?-- No, I don't disagree entirely, but a partial extraction system - rib stripping two sides of every pillar would leave intersections of up to 20 metres from one diagonal to the next, though areas - the take a row, leave a row effectively left a 37 metre span with a 5 metre fender in the middle. Yes, in that regard there is a large volume, but I have not done a comparison of area - effective area to open up.

I suppose as a layman I look at the SIMTARS model over there and I just form the conclusion that I see what are larger areas in 512 than, say, would have existed in 511 where the ribs were stripped?-- Yeah, there are isolated spots in 512 that would have been larger than 511, yes.

You say there was never any specific instruction in ventilating those larger areas?-- No, there wasn't.

The method of mining did - that's taking bottoms - but with the shorter ramps - which was a method adopted for safety purposes; is that right?-- That is correct.

That did leave a lot of loose coal around on the floor?-- Yes.

I think we have heard evidence while you have been here in Court of the amount of coal that was left on the floor. Was there ever any discussion of that in terms of the risks of spontaneous combustion with more piles of smaller gauge coal and in terms of any difficulties in keeping a good flow-through ventilation in respect of areas where those small piles of coal might be? Do you remember any discussion about that at any time?-- The take a row, leave a row and the style of ramping would indicate that we would leave larger - or more loose coal, as such, in the panel, yes. I talked to Cocky on a number of occasions - you know, before the panel started extracting on that type of system - but there was a possibility - you know, that - well, we were a spontaneous - or classified - or had an incident of spontaneous heating in No 2. It was always in the back of your head that it is there, you know.

As I said, was it discussed in terms of the amount of loose coal - was it ever said in any discussion that you were at, "Look, we are going to be left with a lot of loose coal around there and that means that there will be a greater rate of oxidisation of those smaller pieces of coal-----"?-- Yes, Allan and I did talk about that.

Yes. How often was that discussed?-- We would have discussed that either at the beginning of the extraction of the panel,

or just before or just after. I'm not 100 per cent sure.

What was said about that? See, I'm really trying to determine what attitudes were there during the - particularly this extraction phase. I know it may be difficult for you to cast your mind back, but it is relevant to what steps might be taken to avoid these things in the future, you see, to know how people approached it?-- Right.

What I'm asking you is to take your mind back and to address that question. What sort of concerns were there amongst the management, including yourself, when this extraction was commenced?-- Well, Allan and I talked about the possible CO make that we would get out of the panel and also the life of the panel. In his experience, he said that he would expect to get a rate of about 1 litre per week using that type of mining system, purely based on his experience at the - at No 2 underground, and then I then said, "Well, we will be there for 12 weeks." That was the scheduling time for the extraction of that panel and I hadn't raised a concern at that point because we talked earlier on in our time, well and truly before this, about some type of incubation period which he said was between 12 and six months - you know, possible 12 and six months - and then since I had been at the underground, the panel next door we ran for five months, the 401, 402 was between, I think, eight and nine months, 403 - you know, I'd experienced a number of panels that were significantly longer than the 512 and therefore had never really cast a major problem in my mind.

Well, you have had some notion yourself about the incubation period of the coal?-- Yes, people - we talked about different-----

Was it from your own experience, you say?-- No.

This was just from what you knew-----?-- This is through discussions with people - local people.

But in the end result, when you discussed it with Allan Morieson, he suggested an incubation period of between 12 and six months?-- Between 12 and six, yes.

You weren't really in a position to dispute that?-- No, I couldn't.

Did you have any view as to whether it was wise to rely on any notion of a sort of fixed incubation period? I mean, as a mining engineer, did you have any view about that?-- Yes, I did. I understand that there were - that the system of analysing a - samples of coal - there are so many variables that are possible when doing these type of tests that it could be quite misleading - it could be. I don't know. I haven't tested any coals myself or seen any results, but I assume that an environment - it would be very difficult to create an environment similar to what you were producing underground.

Every panel is going to be different?-- That's correct.

Now, did you say anything like that to Allan Morieson, "Look, you know, it might be 12 to six months elsewhere, but we are dealing with a new situation here."?-- No, I didn't. No, I can't - I can't remember if I did say that to him.

You say that he said something about an expectation of one litre per week during the life of the panel; do you mean an increase of one litre in the CO make from week to week?-- That is correct.

He had come through as a miner and then a deputy; is that right?-- That is correct.

And ultimately ventilation officer?-- That is correct.

Okay. As a mining engineer did you yourself raise any concerns with him or make any observation to him as to whether or not there should be that sort of increase in the CO make?-- I wasn't really there to question - I didn't have enough experience or knowledge myself to say yes or no.

I suppose that's what I'm asking you in one sense. I mean had you ever read or seen anything that suggested that there would be a steady increase in CO make during the extraction phase of the panel?-- Yes, the whole - the definition of spontaneous combustion is the oxidation of coal. We knew that we were leaving coal in the goaf as we have done on every other extraction phase whether it be loose or in remnant pillar form, and naturally you exposed a lot more coal as you extracted. So you would get an increase - once you have a CO make I was always under the influence that you would have (a) a continual rise - now, what that rise was I wasn't there to - I didn't have enough experience to say yes or no to what the rise was.

You say a rise from week to week -----?-- From week to week.

Your view was that as long as it was just a steady rise there was no difficulty, that wouldn't indicate any problems?-- A steady rise, and then also from Mines Rescue training, you know, they have discussed the limits that Mackenzie-Wood introduces into his book, yes.

In terms of the actual figures on litres per minute?-- That's correct, yes.

We can come to that, but you speak about this acceptance, or at least your view being that it was acceptable to have a steady increase -----?-- Yes.

----- in CO make. Was that something that you had read or something you had learned in some way or was it just a view that you adopted because it seemed to you to make sense?-- From a practical point of view it makes sense, yes.

You hadn't learned that?-- No, I had not, no.

Righto. Well, the litre per minute - 1 lpm rise, did you see any reason to question that?-- No, no, I didn't have -----

You weren't in a position -----?-- I wasn't in a position to question it.

What systems were set up then at the beginning of the - perhaps I should say as at the beginning of the extraction phase in 512 for the monitoring of CO make?-- There was a - Allan - part of our - if I lead up to this, part of our QA system was that the ventilation officer would monitor CO make during extraction part. It's part of our part 60 submission. So he would go on a regular - every Friday he would go down to a designated point, a vent station underground that had a cross-sectional area that he was aware of, and he would then take his spot ventilation readings, CO parts per million and then use that in his calculation for a CO make or a weekly basis.

Was that the principal part of the system that had been set up, the measurement from week to week?-- Yes.

That's using the Drager tube at the vent station and calculating CO make in that way?-- That's right, in conjunction with the Unor, yes.

You say "in conjunction with the Unor". Now, what role did the Unor play in that system?-- In setting up the table, the log table that Allan kept his records on, we placed the ventilation, the methane, the make - the parts per million, beg your pardon, at the vent station using the Drager and used the weekly average of that vent station to calculate his CO make.

You say you used the weekly average?-- The weekly average, yes.

Weekly average of the CO in parts per million off the Unor?-- Off the Unor, that's correct. The Drager that he used on the day, on the Friday, really was as a check to see what was actually happening on that Friday.

What was the position from Friday to Friday at least through until - putting aside 22 July that we have heard about, we will come to that later, but what was the position in terms of the comparison of the Drager tube reading and the weekly average of the Unor reading?-- It always seemed that the Unor, the weekly Unor, was consistent with the Drager on the Friday. The weekly average on the - of the Unor was consistent with the one on the Friday. About 95 per cent -----

When you say "consistent", what do you mean? The same?-- The same. Roughly the same.

Roughly the same?-- Yeah.

How roughly? I'm interested to know, because ultimately these were the points that were plotted on the graph?-- Most of the

time - I can look back at the actual graph, but nine out of 10 the Unor was actually higher than the spot reading on the Friday.

That weekly average was calculated automatically on the Unor system, was it, or was that something that you did each week?-- That's something you did each - you called up on the touch screen every week.

You could call it up directly from the Unor?-- That's right.

The weekly average?-- The weekly average parts per million, yes.

Did you have some involvement with establishing that system on the Unor, that's the system to record the readings and to then plot positions on a graph?-- Prior to my arrival at the underground the ventilation officer would give his readings to the then manager, Mr Reed, and then he would record them in the mine record book. Basically from the 511 panel Allan and I discussed what he was doing, and as part of the QA system of keeping records and also for us being able to identify what was happening we created a system on the Lotus spread sheet to continually sort of update graphs and logs while collecting the information, yes.

I do in time want to take you to one of those graphs and have you explain a bit about that system, but it may be appropriate to leave that until after lunch. Thank you, Your Worship.

WARDEN: Thank you. Can we adjourn for lunch and resume at about 2 p.m.?

THE COURT ADJOURNED AT 12.59 P.M. UNTIL 2 P.M.

THE COURT RESUMED AT 2.06 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR CLAIR: Before lunch I promised to ask you about the way in which the system was set up, the one that you set up on the Lotus 123. If the witness could see Exhibit 21? Just while that's being obtained, Mr Abrahamse, the system was set up first of all to record the CO in parts per million, is that right, CO readings in parts per million that were taken and recorded as part of the ventilation officer's regular readings; is that one of the purposes?-- That's correct, yes.

And then was designed to show the calculation in litres per minute from the other data that had been collected; is that correct?-- That's correct, yes.

The system was also designed to show - perhaps you can tell me. Was it designed also to show the Unor reading?-- That is correct, yes.

And then from that data to plot a graph; is that so?-- That is correct, yes.

Probably the best page to go to is the first page in respect of 512, first page of the data in respect of 512 which is six pages from the back of the document. You've got that one?-- Yes, I have, yes.

Is that a fairly typical set-up of the data style page that was established under the Lotus system?-- That is correct, yes.

Was there some other aspect of the system that was set up apart from the graph? I'm just looking at how wide this system was?-- You mean visually on the spread sheet?

Yeah, on the Lotus spread sheet that was established?-- All you had was that format of a table.

Yes?-- And then your graph was located a number of sheets below that.

Yes?-- And then on the right-hand side column the litres per minute were on another little table that are used for graphing purposes. The information from that table on the right-hand side, graph, that was all that was on that spread sheet.

This and the graph was the sum total of all that was recorded in that Lotus system?-- Yes.

The setting-up of this data page, I suppose, was relativity straightforward; is that right? You knew what information you wanted on there and you set it all out in columns?-- Every square, and it was - represented a cell on the spread sheet, yes.

What about the graph? How did you set that up? I mean when you first set up the graph in the Lotus system how did you set that up?-- On a weekly basis the X axis, the dates - you had to update the information that you wanted to include in your graph on a weekly basis. So what it meant was you had a - say, for example, week three in your extraction you only had three sets of data graphed. In week eight, for example, you had eight sets of data and so on and so forth. That's the way the original draft of the CO make spread sheet was set up.

Okay. The purpose being what?-- The purpose being that the CO make would be made only on a weekly basis and each row - each date that you would put that data in would then go - would be added to the column - the table on the right-hand side which would automatically be graphed on a week-by-week basis.

So, you drew up your data, you then put the relevant data into

the column over on the right-hand side?-- It automatically went to the information on the right-hand side.

It went to the information on the right-hand side?-- Yes.

It was, in effect, automatically extracted as part of the Lotus system?-- That's correct, yes.

And then that information that was on the right-hand side was graphed onto the graph?-- And that was adjusted every week, yes, that's correct.

Now, who did this each week?-- I initially - Allan Morieson and myself set the tabloid up, and then in the process of that I taught him how to use Lotus spread sheet, how to get print-outs, how to put information in, and then he would then do that on a weekly basis.

At what stage in the process did he take it over on a weekly basis?-- Oh, this was well and truly - the 511 Panel.

511 Panel?-- That's right.

Now, go over two pages from that page that you have just been looking at and you see the graph there. That's a graph on 512. Now, the reality is that when the information was first of all entered into the data sheet for 512 and then subsequently transferred to the graph, it really didn't work as it should have, did it?-- As I understand at this point, no.

Well, you know the difficulties, you have heard the evidence?-- I have heard the evidence, yes, that's right.

And on the first three entries there is an entry per month for February, March and April?-- The first two were taken from monthly ventilation reports, yes.

Well, the third one is almost a month after the second?-- That was the first date - that would have been roughly the first figure taken for the start of extraction.

Which would have been -----?-- Extraction commenced on 29/4.

29/4?-- That's correct, in the heading at the top.

Yes?-- So, you could basically say that on the 27th you started extraction - I mean, as close as you had to be.

And then the graph goes to the 9th which seems to be about a fortnight, is that right, roughly a fortnight between 27 April an 9 May?-- Yes.

Then there is four days between that and the next reading on 13 May?-- That's correct, yes.

And then we get into a weekly routine for a short time there, the 13th to the 20th, 20th to the 27th, the 27th to 3 June and

then to 10 June?-- That is correct.

We actually do have a spell there where it is a weekly reading?-- That's correct.

Then we get to 10 June and the next reading is 11 June, and then the next one is 16 June which isn't even a week after 10 June, so that what we have got up to that point is really what could only be described as a worthless document in terms of a graph, isn't it?-- No, I don't agree with you.

Well, do you agree that the points that are plotted on the horizontal axis are really just not correctly plotted because they are points that are taken at quite different time intervals?-- I do agree with that, yes.

So that you end up with slopes between one point and the next which simply can't be related to other slopes within the graph?-- Yes, you could - yes, you could not compare actual slopes, no.

I mean, the purpose of a graph is to be able to look at it and see a direction within the graph that indicates some trend, gives you an idea of rate of increase?-- It gives you an idea of a trend, yes, it does.

It might give you an idea of the trend but the trend doesn't reflect the appropriate rates of increase or decrease at any given time because the time intervals vary from point to point?-- But there is no - there were no actual lines to indicate a rate of rise. If you were going to put a rate of rise in, that would be a different line altogether.

Yes, that's right?-- And that wasn't indicated on this graph.

But even to look at that and to get some notion of a rate of increase, really you would be quite misled by what you see there on the page, isn't that so? I mean, for instance, if you were to determine what was the rate of increase between 28 February and 10 June, then you would have quite a different line if you took it to 11 June which happens to be a week further along the bottom axis, and in fact it's the next day?-- Yes, I agree with what you are saying, yes.

And then, of course, the dates become a bit out of kilter again towards the latter part of the bottom axis on this graph, don't they, because what we have is 5 August and 6 August plotted, in effect, a week apart on the predetermined parameters of the graph?-- That is correct, yes.

And that difference is a crucial difference because the rate of increase between the 5th and the 6th would be a much, much greater rate of increase than is shown on the graph?-- That's correct, yes.

Because it would go up, to make it simple, seven times more sharply than what it does on the graph there, wouldn't it?-- That is correct, yes.

Okay. Well now, we know from what we have been told that this document wasn't issued in any event until after the explosion, but -----?-- That's correct.

I refer to the last point plotted - that is, this document that you see in front of you with that last point plotted on it wasn't issued until after the explosion, but I refer to the last point plotted to illustrate that point, that really the document plotted in the way that it has been is really quite useless, whether you are looking at the last point or whether you are looking at the early points, isn't that so?-- No, I disagree with that.

To what extent do you say that it is a useful document?-- It is a useful document to give you an idea of - on your week to week rises where you actually are and what quantities you are looking at and also a line - a general - you know, a general rise, very general rise.

But, Mr Abrahamse, in saying that, aren't you really settling for very much a second best -----?-- Yes.

----- if you say that gives you some indication of the week to week increase?-- Yes. I mean, that is - it is a second best, and since we have - since people have been analysing the system, it obviously has come to our attention, my attention, that maybe in constructing this graph I should have used an X/Y plot system on the Lotus instead of a straight line graph.

Straight line graph representing weekly intervals?-- Weekly intervals, that's correct.

When in fact it wasn't being plotted on a weekly basis?-- If I can explain the origins of the graph. If you look at the graphs preceding or before the 512 section, the 401/402, they were taken on a regular weekly basis. Before the 512 extraction started we - Allan and I - Allan actually went to a firefighting course in Newcastle, and one of the things that they instilled in him while he was in Newcastle was the fact of accountability and he talked - we talked about that in general, and so in that context we said, "Well, okay, let's put more information on the graph to show accountability.", and the first part of that - looking at that accountability was - the first question was what was our development rate of make? That was easily determined by past ventilation - monthly ventilation surveys, and he - we - he input that data, which were the two points in the first part of the graph. The second part was he said that if something happened in the panel where he did check - where he checked, rechecked calculations or readings that he took by putting that information on the - in a tabloid form, that showed his accountability for checking on different things. Now, that was discussed while we were making that up. I did not at that stage look at changing the configuration of the graph to an X/Y plot to suit for - suit those dates.

The tabloid form you talk about is the one we looked at before?-- That is correct.

That was printed on the back of the graph, was it?-- No, no. You could print it on the back of the graph, but you printed it as a separate sheet.

We have been told that this graph from week to week went up in the deputies' cabin?-- That's correct.

It went up there for a purpose, I take it?-- Yes.

What was that?-- To give people, or give other deputies an idea of what was happening in the mine, information.

We have been told also that for the one that went up in the deputies' cabin the table was printed on the back. Were you aware of that?-- It could have been. You could have printed it on the back. When you get a print-out of your graph, normally Allan would just get a second print-out of the log. What he did with it from that on the photocopy machine was up to him.

Did you have any ongoing involvement in the production of the graph in respect of 512? Did you and Allan talk about it?-- The graph in general?

That graph you are looking at there, did you have some ongoing involvement in that from week to week?-- I had very little involvement with the actual production of the graph because Allan was competent enough to print it out himself.

Did he bring it to you? There was one that went up in your office too, wasn't there?-- There was one that went up on Allan's noticeboard.

That was just around the corner?-- That was around the corner, that's correct.

In fact, to get to your office you would walk past what you have referred to as Allan's noticeboard and you go and sit down at your desk around the corner; is that right?-- That's correct, yes.

But the only - well, the main entry into your room was through the general area where he was located?-- That's correct, yes.

And you would go past the graph and, no doubt, you saw it from time to time?-- Yes, I did, yes.

Let's assume that a deputy comes into the deputies' cabin and this graph, or the equivalent of this graph, was posted up there up to the point of 11 June, for instance. Take 11 June?-- Yes.

Now, he comes in, the table - if you assume what I told you to be correct, that there was some evidence that the table was printed on the back and the graph was then put up on the wall - the table is on the back, so he doesn't actually look at the readings, but what he does look at is the graph. It's up on the wall and he is interested to see what is going on in the

panel as far as CO make is concerned. Now, I would suggest to you that it is reasonable that what he is going to look at is the line, the direction of the line?-- That is correct.

He is not going to look at the dates because he knows that it is plotted weekly, at least that's what he has been told, and he can see the vertical lines there, and no doubt what he would say to himself is, "Oh, well, last week it seemed to be heading up pretty quickly." When I say that, that's the segment represented between the 3rd and the 10th?-- That is correct.

And in fact that's precisely what a deputy might say to himself if he sees that rate of increase in the CO make?-- That's correct.

Then he would say, "Oh, it seems to have levelled out this week.", when he looks at the segment between the 10th and the 11th?-- That is correct.

But if he thought that, he would be totally misled, wouldn't he?-- He would be.

Because in fact the rise between the 3rd and the 11th would be almost as sharp as the rise between the 3rd and the 10th, wouldn't it?-- That is correct, yes.

And he could be lulled into a false sense of security when he looked at that graph up there with its level - almost level section between the 10th and the 11th, wouldn't he?-- But he is still in the region of between 11 - around 11 parts - 11 lpm.

Well, that may be so, although if he had concerns about the level above 10 lpm, he may well still be concerned, but if he was a deputy who was looking for a rate of increase in the make of - in the CO make and the rate of production of CO, then he would be misled; quite simply he would be misled?-- To look at it quickly, yes.

Well, do you think a deputy is going to do anything more than look at it quickly and see which direction the line is taking?-- But the two - the level of the 10th and the 11th are so close together, even if we did confine the two, you would still find it would be at that same point, your rise - your rate of rise would be exactly the same. I understand what you are saying. The perception is flat, not a problem.

The perception is that over the week represented between the 10th and the 11th, although it's only one day -----?-- One day.

----- the CO make has levelled out?-- No argument the graph could have been made better.

So, at least in those circumstances the document was pretty much a useless document, wasn't it?-- No, not totally useless. It was, in the words you used before, maybe less than adequate, yes.

If anything, in those circumstances involving the 10th and the 11th, the worst thing is that it could be positively misleading, and I think you have agreed?-- It could be misleading.

Now, I want to move away from the graph and go back to that page two pages before where you have the tabloid section of the data. Now, you were part and parcel of establishing the fixed parameters on that graph?-- That is correct, yes.

And you will see there that in respect of each of the weeks - at least each of the readings that's recorded there - that there is a reference to vent station 46 and vent station 59 as being the positions at which the readings were taken, or to which the readings referred is probably the best way to put it?-- That is correct, yes.

Well, were you ever aware of any confusion about where those readings were to be taken?-- Vent station 46 was located in the 510 bottom return between No 1 heading and 5 South, and vent station 59 was located in No 5 heading in 512 Panel between 0 cut-through and 1.

0 cut-through?-- On 0 cut-through and 1 cut-through, 512.

Turn and if you don't mind standing up, looking at that first map behind that one, you will see that better represented. You can sit down if you like and take up the laser pointer if it is still there. Okay. Now, vent station 59, you were saying?-- Between 0 cross-cut and 1 cross-cut in 512.

In the bottom return?-- In the bottom return.

46?-- During the development stage, vent station 46 was located between heading - 1 heading and 512 and 5 heading and 5 South during development.

And-----?-- That was my understanding.

And when did that change?-- I had assumed when we constructed the sequence plans for - or the Part 60 for extraction, we had always installed a vent station in the - inside the panel inbye the seals. We have plans where we were going to - well, I was under the impression that the vent station was located in this position, just inbye the 512 No 1 seal.

At what point?-- During extraction.

During extraction?-- Yes.

So the change, as far as you were concerned - the change that you have referred to occurred immediately upon the commencement of extraction?-- Yes, that's right. The reason why - during the development stage, I had to do quite a considerable amount of walking between No 1 heading and 5 South when we were installing the equipment - installing the extensionometer and cable equipment for monitoring of the pillars, and you would go through - or pass the monitor point, through the regulators to go into 5 South.

Just indicate that?-- You would have to travel up the 510 No 1 heading.

That's 512?-- I beg your pardon, 512, 1 heading, past the monitor head which is located at that spot, through the louvre doors, and then down to 24 cut-through in 5 South.

That was during development?-- During development, that's right.

But now you say that you understood that it was changed when extraction commenced?-- On the extraction plans that we had - that I had drawn up after discussion with our management team, we'd always - in all the other panels in the pit it was the norm to put a vent station inbye of your prep seal inside the panel. So, for example, in the 401 and 402.

You will have to go back to the other plan?-- In the 401, 402 panel - my hands are all shaky - we had the monitor located inbye that prep seal and also on the top return inbye that prep seal. The 511 was the same. It was located inside the top return prep seal there and inside the bottom return prep

seal. That was the normal way we would set the panel up.

Now, I know you refer to "we" and "this was normal". I'm keen to know, (1) who makes the decisions; secondly, how the decisions are communicated to all of the people who need to know the location of the vent station; and, thirdly, how it might be that there was this understanding amongst a fair body of people that the vent station and the monitor point for taking of readings was still located outbye the seal in the No 1 heading in 510, right up to the time that the panel was sealed?-- Could you run through each one of those for me individually?

Yes. The first one is who is it that made the decision as to where the vent station was located?-- It is difficult to say who made the decision. When George Mason, Albert Schaus and myself would discuss the sequence plan for Part 60 of the extraction, we would just indicate where our sequences would start and I would put down where the monitoring points would be, and we would discuss that over - you know, over the table. So, that's really - it is a group decision. It was a system that had always been there to put them inside, and it was just - I would have just - as we talked, I would have put the star for where the monitoring point was to be inside the prep seal.

You would put that star on a plan of some kind?-- That's correct, yes.

What happened after that? What happened under the system that you had?-- That would have gone to the surveying department - the open-cut - and they would draw up the sequence plan and would label locations of prep seals, location of monitoring points, basically what you have in front of you there, or what is in - all that is included in the Part 60, which is your vent station for bleeder returns, your cut-through numbers, your contour lines, the surveying department, and-----

So it is a full plan?-- It is a full plan, yes.

What would happen to the plan after that?-- That plan would then get published X amount of times. You would send a copy to the department. You would have a number of - one copy in the section, I would have a copy, Albert would have a copy, the undermanagers would have a copy and then I always kept one or two spare in the - for record - Part 60.

I won't say a registered plan, but it is an official mine plan?-- That's correct.

An official mine document?-- Mmm.

So, what would happen in the system after that? We are talking about this plan being the plan for extraction?-- That is correct, yes.

So, up to this point - up to this point, everybody has been proceeding on the basis that the monitor point has been located in that location in No 1 heading at 510 that you have already indicated?-- That is correct, yes.

What happens after the plan has been done? How does everybody find out that there has been a change because you are now moving into the extraction phase - a change in the location of the monitor point?-- I don't know. From an operational point of view it would have gone from there to one of the deputies to - someone would have asked one of the deputies or preferably Allan Morieson to locate that position.

That seems like a fair bit of speculation on your part?-- It is.

You say somebody would have; can you tell me what steps were there as part of any system to ensure that everybody knew where the monitor point was?-- There wasn't a system to say, you know, pass the piece of paper; but - I don't know. I can't honestly answer that.

Let's start with this: what would be done physically in relation to each of those points? Now, let's start with the fact that the monitor point - if you don't mind standing up and pushing that top plan over. Start with the fact that the monitor point during development was in No 1 heading at 510, just outbye the top return at 512?-- Yes.

Okay? What was there? Was there something on the wall - pointed on the wall first of all?-- This is at vent station 46.

Yeah, vent station 46?-- Yeah, Allan would put a marker on the wall, indicating the vent station number, and there would be a filter head for the Unor located at that point.

A filter head for the Unor?-- For the tube bundle system.

Hanging down from the roof?-- Hanging down from the roof.

It hangs from the roof. Is it easy to see?-- Yes, it is.

And a marking on the wall, a white - some sort of white cross?-- No, a piece of wood with a - with the actual number in reflective lettering on it.

That would have "VS46" on it?-- That is correct.

All of the deputies who have to do their readings from shift to shift, if they have to do them at the vent station, they would take notice of that; is that right?-- Yes, you would - yes.

Allan Morieson obviously doing his readings from week to week would go and take them there?-- Yes.

You would accompany him on some of those Friday-----?-- I had not accompanied him on any in the 512 panel.

Okay. And as you say, the Unor readings you would know are going to be taken from the gases at that point - the atmosphere at that point?-- That is correct.

We move into the extraction phase. This plan is drawn up. We then have some speculation as to how that is communicated. What happens physically, first of all, with the Unor sampling head?-- All that would be is an extension put on to be led through to the - through the prep seal to that - whatever location that you've asked to go to.

Who would do that?-- On an assumption, I would say Allan would do it.

Allan Morieson would actually put the extension on?-- No, I honestly do not know who exactly would, but I assume that he would.

It is not a job for the electricians to extend the Unor tube further?-- I don't know.

I'm just asking you?-- No, I don't know.

Do you know if he did actually extend it around the corner?-- No, I wasn't aware that - I wasn't aware that he didn't - from information that's been given in the Court.

Sorry, you weren't aware-----?-- That he did not.

That he did not?-- Yes.

Were you ever down there during extraction in 512?-- Yes, I was.

In the top return?-- Yes.

Did you ever see the Unor sampling head?-- No, I didn't - inbye the prep seal?

Yes?-- At that time I didn't, no.

Did you see it back in the old location, outside-----?-- I couldn't remember seeing it there either.

Is there any - first of all, is there any formal system for permission to be given for the relocation of a Unor sampling head?-- I don't know if there is a system - an operational system in place for approval to change it, but I was aware that Allan Morieson and I had the discussion of where we were going to locate the head when we were drawing the plans up and I had said "inside the prep seal". He didn't want to go inside of the prep seal because of the way the prep seal had been built. He thought that it would cause too much turbulence, but I am aware that he did get the surveyors to measure the cross-sectional area of that location that was marked on the roof.

Inside the prep seal?-- Inside the prep seals.

And there was a location marked there?-- There was a location.

Do you know who marked that?-- Again, I'd be assuming. It would be Allan because he asked the surveyors to mark - to get the surveyed cross-sectional area of that point - assumption again.

And the purpose of getting that surveyed cross-sectional area at that point - which was to be the new vent station 46; is that right?-- That is correct.

Was to incorporate it with the data that you used to calculate the CO mark; is that right?-- That is correct, yes.

Because you need to multiply your cross-sectional area with your wind velocity and then multiply it in turn by the CO make - by the CO in parts per million; is that right?-- That's correct. It was my preference to have it inbye the seals so that you would not - if there was any chance of some dilution from anywhere, leakage of stoppings, the sample would be just purely representative from that one section.

What was your view about this suggestion of turbulence of the position inbye the seals?-- I wasn't taking the readings. If he said that he had problems - because of turbulence or - I didn't question because I didn't know.

That turbulence could have an effect on wind velocity - a measurement of wind velocity?-- Yes, it could, if it has a buffering effect, yes, yes.

So that, in fact, it might give you a slower reading on wind velocity than was, in fact, the case - is that your suggestion?-- No, not necessarily a slower, but you would get a greater number of variable - you could get a greater number of variable readings in that heading. That was more - because you took your three readings to get an average, there was a greater possibility of - that's what was Allan's concern - you would get a greater number of variable readings.

How did you address that concern? As you understood it, the vent station moved in there in any event?-- It did, yes.

Did you address his concerns in any way?-- No, I didn't. I didn't. I thought that's what - was the best place to put it.

Now, we come to the difficulty then that within the fixed parameters that were entered into the data sheet there was the cross-section of the - the cross-sectional area of vent station 46; is that right?-- That's correct.

Now, we have here an area - 21.92?-- That is correct, yes.

Was that entered on the basis that you understood that the - that is, that vent station 46 as from the commencement of extraction was located inbye the seals?-- I had never thought anything more of it, yes.

Was it entered on that basis?-- I don't know.

Do you know which area that is - 21.92?-- No, I don't.

So, 21.92 was the area - cross-sectional area inbye the seal in the top return, and the measurements were actually coming from and being made at the position where vent station 46 had been previously. We have really got a highly unreliable record of calculations of CO make for this panel, haven't we?-- I understand that Allan Morieson did say that the location - the cross-sectional area between the two locations was absolutely negligible. I do remember him saying that, yes.

You mean in evidence?-- No, not in evidence. This is pre the explosion.

Pre-explosion?-- Well, yeah.

In what context did that arise - that discussion?-- With regards - just location of the monitor points, because he had got a cross-sectional area completed by the surveying team.

Yes. But in what context did it arise that he said, "Oh, look, there is very little difference in the cross-sectional area between one point and the other." I mean, obviously he would have one measured before the development phase?-- That's correct.

Because all the calculations were done at the vent station 46 when it was outbye the seal?-- Monthly ventilation points.

Monthly ventilation points, that's right?-- Yes.

But there is no doubt that he would have had that measured; isn't that right?-- That is correct. That was an old station.

And you say that he did have it measured inbye the seal?-- He did, yeah. He showed me the-----

Wouldn't he just use the measurement for the old vent station 46 outbye and then the measurement for the original readings, and then use the new area inbye the seal when the readings were taken in there?-- I would have assumed that, yes.

I'm just asking you in what context then any discussion arose about one being pretty much the same as the other or almost identical with the other?-- Well, he still maintained that with his - that he would get turbulent flows inbye the seal and it didn't really make any difference.

That's not my question though. My question is in what context did this discussion arise during which he observed that one cross-sectional area was much the same as the other? I'm just wondering how that came up?-- We - Allan and I talked about so many different things at so many different times, you know, whether it be over a cup of tea or a bit of lunch -----

It would be an odd thing to say over a cup of tea -----?-- No, it's not.

If he measured one and used that for all the time the vent station was located outside in the original location of vent station 46 and had measured the one that was inside, it would be an unusual thing for him simply to say over a cup of tea, "By the way, the measurement at the new point for vent station 46 is the much the same as the measurement at the old one."?-- No, he would have. I don't see why it would be out of context.

Was there any suggestion at any time that perhaps readings that should have been taken inbye the seal had been taken outbye the seal at the old point or vice versa?-- I wasn't aware of that. I can't recall that being part of the conversation.

There is mention of them both being almost identical in area. It didn't come up in that context where there was some worry that measurements that had seemingly been made at the wrong point or anything?-- No. I wasn't aware of that, if that was the context.

I see. Do we have a record of the square metre area that was used for the calculations during development?-- You'd have vent station 46 on the monthly report, wouldn't you?

On the monthly report?-- Monthly reports.

That's during development?-- During development.

Well, do you remember yourself whether there was any significant change -----?-- No, I don't.

----- in the area?-- I can't answer that.

In any event, you proceeded on the basis that all these measurements were being taken in the top return of 512?-- I didn't know which way - I assumed that. I assumed that.

Was there any point in time prior to 7 August that you learned that the measurements were, at least on occasions and probably on most occasions, being taken out of the old vent station 46?-- I was not aware of that, if there was or it wasn't.

Nobody ever raised anything - before the explosion no-one ever raised anything with you about any confusion as to where readings ought to be taken?-- No, no-one.

What about the location of the Unor? You say you don't know whether it was ever taken down around the corner into the top return of 512?-- That's right. I can't remember if it was or if it wasn't.

Are there some plans that are kept by the mine which indicate the location of the Unor sampling points on a progressive basis, that is, that are updated every time there is a change? It's a pretty important factor, isn't it?-- Not that I'm aware of, no - beg your pardon, there was - in the monitor room there was a plan of the operation and when areas were sealed people - you would take the flag off where that location was and change the vent point number. That gave you an idea of looking at the screen, looking at vent station 5 and then looking on the plan. There was that in the monitor room, so you could make reference to that.

Who would do that?-- I don't know who would do that.

If there is no system for updating that, isn't that a problem, because at any given time there wouldn't be an accurate plan showing the location of the monitor points, the Maihak or Unor monitor points; isn't that right?-- That is correct.

And in fact we have a classic example here of just not knowing and not having any record as to where the monitor point actually was for vent station 46?-- For vent station 46, that's right.

You proceeded on the basis that is it was inbye the seal right through the whole time?-- I did, yes.

And that led you, no doubt, to have some confidence in the integrity of the reading because it was collecting gases, as you said, collecting the atmosphere from 512 and it couldn't be contaminated by anything else?-- That's correct, yes.

That to you was important; is that right?-- I thought it was important, yes.

Because if the doorway was left open, for instance, in that 510 No 1 road then you would be getting some other atmosphere into the No 1 road?-- That is correct, yes.

And you wouldn't have a reliable reading?-- That is correct.

As far as 512 was concerned?-- As far as 512 was concerned.

Now, what about at the time of sealing when sealing of 512 was proposed? Was there any discussion with you about what was going to happen with the Unor monitor points?-- No, there wasn't.

Was that something that you would expect given that you did have a role in relation to ventilation and a broad role

actually in keeping abreast of what was happening day-to-day in the underground operations?-- Maybe it was overlooked, I don't know, but I did not have any input into where - those sort of decisions might have just been made on an undermanager's behalf, I don't know.

I take it from your answer that I would have expected to be consulted when you say it may have been overlooked? What I asked you is in light of your obligations and duties would you have expected to be consulted about the location of the monitor points upon the sealing of 512?-- No, not really.

Why not? Important matters, aren't they?-- They are important matters, but there were a lot of other things that I most probably was doing at that time and when discussion points came. It was an operational aspect. The sealing process was an operational aspect. Realistically I didn't have - I had a bit to do with planning, but actually what happened on a day-to-day was an undermanager's role.

Yes, but -----?-- In the sense of planning, yes, I would have, but -----

And again you had the obligation of keeping abreast of what was happening in the underground operations?-- That's correct.

On a day-to-day basis I think is the way you express it yourself?-- There is a lot of other things other than monitoring gases that happen in an underground -----

Monitoring of gases, particularly when a panel is being sealed, is a matter of considerable importance?-- It is of importance, yes.

We are not just saying that now with the benefit of hindsight, are we? I mean even before 7 August last year it was undeniable that the monitoring of gases during and about the time of sealing a panel was a very important matter?-- That's right. In all the older panels, the 401, 402, 511 like I stated before, the points were put inbye of the seals, just inbye of the seals.

This is after sealing?-- No, this is during extraction. So when it came time for sealing those monitoring heads were left in that location and the seals completed. Most of the - not most, all of the goafs in Moura No 2 filled up with 98 per cent methane and therefore the trend to watch in the general - in the most general sense was to watch the rise in methane level in that panel. Methane would rise to the top of the panel and that's where - your seals predominantly were at the top end of the panel.

So you need to keep an eye on the methane?-- Yeah, that's right, so once that point - that vent station point was established inbye of the seals - now, what distance inbye the seals is - I mean I can't answer that. Most probably most of the time it was just left at that point.

Of course to say that, whilst it's a true statement that monitoring of the methane was important after sealing, particularly at Moura, that ignores the other half of the picture, doesn't it? The other half or at least another major part of the picture, perhaps even more than half, and that is monitoring what was happening behind the seals with a view to determining whether there was a heating?-- That is correct. That comes - that issue in hindsight, and listening to the Court, raises the fact that, well - of multipoint locations. That's something that we can address.

That's something, of course, that might be better judged now with some hindsight, but what I was about to say to you is this: it's not just again with the benefit of hindsight that we say that monitoring the CO or the CO and oxygen relationship behind a freshly sealed panel is really a very important part of the procedure post sealing; isn't that true?-- The CO/CO2 deficiency, the Graham -----

The CO2 deficiency, the Graham's Ratio and the rate of production of CO?-- Yes.

What I'm saying is that those things are very important aspects and I'm saying that it's not just with the benefit of hindsight that we say that. It was known -----?-- It was.

----- back before 7 August last year that they were items of very significant importance, considerable importance after a panel had been sealed; isn't that right?-- That is correct, yes.

And that, of course, goes to emphasise the importance of the location of the monitor points?-- That is correct, yes.

After the sealing of a panel?-- That is correct.

Anyway, you say that you weren't consulted about that?-- No, I was not, no.

You proceeded throughout the whole of your involvement with the monitoring of the CO make during extraction in 512 on the basis that there were these readings being taken in the top return?-- Yes.

Either by Allan Morieson or by a deputy at least each Friday?-- That's correct, yes.

To produce the readings that were plotted on to the graph?-- That is correct, yes.

You proceeded, I suppose, then also on the basis that the Unor point was located in there?-- It was my assumption, yes.

Can I just ask you a little bit more about your involvement with the plotting of these Friday readings? The purpose, as I understand what you've said so far, was to, in effect, produce a graph that indicated a trend?-- That is correct, yes.

And as I understand again what you say, the weekly average was

used to do that?-- The weekly -----

The weekly average of the parts per million reading -----?-- Was calculated against the velocity, that's correct.

That weekly average you mentioned just before lunch was generally a bit higher than the Drager tube reading that was reported?-- To the best of my -----

Did you go that far or am I overstating what you said?-- No, generally speaking, just from a few observations during extraction it was higher.

It was higher?-- Yeah, yeah.

Did that concern you at all, the fact that the Drager tube readings were -----?-- Sorry, did you say the Drager or the Maihak?

Sorry - well, I think you said that the Unor or Maihak readings were generally higher or were for the most part higher than the Unor readings?-- That's correct, yes.

Than the Drager readings. Did that concern you, that there was that inconsistency?-- No, it didn't actually, no. I didn't -----

I gather from what you say there were occasions when the Drager readings were higher than the weekly average of the Unor readings?-- On one instance that I can clearly remember, yes.

That's the 22nd?-- That's correct, yes.

We will come to that in a moment. That's the only one you clearly remember, you don't -----?-- That's the only one I clearly remember, yes.

Was it only the trend that you were interested in or did you attach some significance to what might be called spot readings, that is just the straight Drager reading calculated through to CO make by using the wind velocity at the point where it was taken?-- Sorry? Beg your pardon?

Were you interested or did you attach significance to what I'll call spot readings? That is, a simple calculation using the Drager tube reading and multiplying it out by the velocity at the point where that reading was taken? Did you attach significance to spot readings, the CO make?-- Yes, for the time that you were there, yes, if you registered it, yes, or noted it, yes.

It's not just the trend based on a weekly average that's important, is it?-- No, no.

The spot readings are just as important?-- Just as, yes.

Because for a start they might indicate a concerning level at one particular point in time?-- That is correct, yes.

And also a spot reading compared with a spot reading the previous week might even give you a better indication of trend than merely taking a weekly average?-- That is correct, yes, from a day-to-day - from one day to the next, not one week to the next.

Okay. I want to come to the events of 22 July, but before I do let me ask you this: was there any - given again the wide responsibilities that you had - was there any system whereby you were advised of events within the panel that might have raised some concern about safety, whether an indication of problems with ventilation or an indication of the possibility of spontaneous combustion?-- Just with reference to those, ventilation and spontaneous combustion? Just -----

I was saying was there any system whereby you were advised of events within the panel that might relate to safety? I'm saying for example, for example any difficulties with ventilation or any readings that might indicate some problem with spontaneous combustion or other signs that might indicate problems with spontaneous combustion?-- I don't know if there is a system other than just individuals being able to come to me and say, "Listen, this is what I got. What's happening down there?" But I don't know if there was a system in place.

I can understand what you are saying, but what was it that would induce individuals to come to you if there was no system?-- My openness.

Why would they come to you?-- Why would they come to me?

Yes?-- Because a lot of people did come to me and talk to me about varying things. I try to keep very much an open door policy where maps would be displayed for projects. It was just my nature to be there to listen to people and what they had to say.

So that there would be some people that would respond to your nature?-- Yes.

Your open door policy as it were?-- Yes.

And they might come and mention to you, "Look, the ventilation is a bit slow in the No 2 -----?-- For example, Reece Robertson would - during the development stage - he was a deputy in that section and he would come bantering through the door, "When the bloody hell are you going to give me more air?", things like that, and I would then give him an update on the progressive nature of the overcasts and when they would be commissioned. Those sort of aspects with regards ventilation -----

That was Reece Robertson?-- That was Reece. That was colourful Reece, yes.

That was his personality, to come and do that?-- That's right.

But equally there would be fellows with a more reserved personality who might observe those things and may not come and tell you about them; is that right? Observe a problem with slow ventilation or even become aware of a bit of a smell of some kind in the panel and because there was no system and because perhaps they weren't the kind of personalities to respond to your open door disposition they might not come and tell you about it?-- I don't think there would have been very many deputies that were there that didn't respond to me. Maybe the dog-watch deputies that I didn't know that well, maybe they would be about the only deputies that wouldn't. Because of my involvement on day shift and afternoon shift with regards the gas drainage crews I would often be at the starting point.

Did you read the deputies' reports?-- I read some deputies'

reports that were on the - at the starting point, yes, sometimes.

How did you choose the ones you read and those you didn't? I mean -----?-- I predominantly went to areas that either I was going to go to for the day so I knew what had been going on - say, come in at day shift, look at night shift 1 North-west. Because engineers - once a panel has been designed and worked out, it was really out of my control after that. You then go down to other areas in the pit and star gaze into black seams to see where you are going to go in the next three, four months, you know, so I would go to areas that weren't frequently visited.

To the extent that you did read some deputies' reports, it was a bit haphazard?-- I did not have a system of systematically going through every deputy's report.

Did you read the undermanagers' reports?-- Yes, I did. That I did.

Did you find those particularly informative or not?-- Yes, I -----

You did?-- I did for what I required, yes.

What sort of things did you require?-- Understanding where panels were up to, if they had encountered any problems in the coal mining panels, I had - specific to the drilling of the section for the drilling, and any outbye jobs that - project work that was completed underground.

What about if there were problems with ventilation and that sort of thing, did you tend to find that that kind of information found its way into the undermanagers' reports?-- No, not really. In a general term, no.

Well then, in terms of your knowledge of the 512 Panel, did you ever become aware of the fact that on 17 June of last year that there was concern on the part of Reece Robertson about some layering and backing up in the No 2 road and a warm feeling?-- I've got a yes and a no answer to that with a different time period. I wasn't aware of - to the extent of what actually happened on - with regards that layering. I was on holiday between the 16th - 16 June and 11 July, like I said.

You mentioned that?-- I had one occasion I rang Albert during that time and he did mention to me that they had taken a sequence on the uphill using the bottom return and give themselves - had caused a little bit of a ventilation problem, had fixed it and wasn't a problem any more, and I talked about a whole heap - a whole host of other issues - that wasn't what I was ringing up about - with regards budgeting information, and I never thought anything of it after that.

Did anybody ever report to you that one of the undermanagers, Mark McCamley, smelt on that day a very slight tarry smell?--

No, I'm not aware of that.

You didn't ever become aware of that?-- Didn't become aware of that.

Was that a matter to which you would attach significance?-- I would, yes.

Did you yourself have any input on the changes that might be made to ventilation to solve problems like that?-- I might of. There are a lot of experienced deputies and undermanagers there that were a lot senior to me with regards practical years of experience in the industry.

If you wanted to know what the particular state of ventilation was in relation to a panel at any given time, where would you go to look at that?-- I would have to ask Allan Morieson or physically go down the pit myself.

There is no central map that was kept up progressively with ventilation changes?-- No, there wasn't, no. There was a - our standard top return, bottom return and the removal of the bottom return Holywell stoppings as we progressively came out. The extraction of the - the removal of the bottom return Holywell stoppings would have been recorded in the undermanager's book.

That was progressively opening up the goaf as you moved back out; is that right?-- Not the - as you passed a particular cut-through - line of cut-throughs you would then take the next two - next one or two Holywell stoppings down, yes.

But other ventilation changes - I mean, they would be predictable ones?-- Predictable ones, yes.

Other ventilation changes, were they recorded somewhere so you could, or anybody for that matter, sit down and say, "This is the position we have got at the moment. As far as 512 is concerned, the ventilation is coming down the intake road and" -----?-- No, no.

The only way to discover that would be to go down and do a whole circuit of the place and see what the position was physically on the ground?-- That is one way, yes. I had not -----

You wouldn't be able - you wouldn't do that?-- No, I wouldn't.

But anybody who wanted to discover the position with ventilation would have to do that?-- Yes.

WARDEN: Before you go onto another subject, Mr Clair, we might take a break.

MR CLAIR: Yes, that is an appropriate time, Your Worship.

THE COURT ADJOURNED AT 3.17 P.M.

THE COURT RESUMED AT 3.30 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR CLAIR: Mr Abrahamse, I was asking you before the break about what system might have been in place to make you aware of what was happening in the panel, and I canvassed, first of all, the events on 17 June and you said that you did learn of that during your vacation, you learned that there had been something which had occurred in the panel in respect of ventilation?-- That is correct, yes.

A bit of layering, I think?-- No, I had - no, I had just heard that there - you know, they had problems with the ventilation. There was nothing specific. I didn't know anything specific at that stage.

Did you subsequently make any inquiry when you came back from your leave -----?-- No, I didn't.

----- as to what the problems were?-- No, I didn't, no.

You say you never learned of Mr McCamley smelling a slight tarry smell?-- No.

What about events on 24 June when Mr Robertson spoke of smelling a smell, a benzene-type smell I think he described it as?-- I only found out about that after the event.

After the explosion?-- Mmm.

You would have continual contact with Mr Mason?-- That's correct, yes.

Mr Schaus?-- That's correct, yes.

The undermanagers, Mr Squires?-- Yes, on a - yes, I would, yes.

Mr McCamley from time to time?-- From time to time, yes.

Mr Atkinson?-- Yes.

Amongst that group was there ever any discussion about these signs that had appeared in 512 suggesting that there might have been a heating?-- No, I - honestly not, no.

Well, you came back from leave on which date, I am sorry?-- 11 June.

11 -----?-- July, sorry, I beg your pardon.

At that stage, as I recall, Mr Morieson was still there as ventilation officer?-- He was there for another - for the one week.

Through to the 15th?-- Through to the 15th, that's correct, yes.

Did you have any conversations with him that week about the CO make in 512?-- I can't remember actually having specific conversations with him about the CO make. It most probably would have been up - it was on the board - he most probably would have said something, but I can't recall if he said anything in particular.

It certainly wasn't raised with you by him either in casual conversation or in any more formal way as a matter of concern?-- Not at all, no.

Did you know what level it was at at that time? When you came back from leave did you see what level it was at?-- I can't remember if I honestly took note of it during that week. I had four and a half weeks - three and a half weeks away and my work had fairly well marked on top of - with regard just administration work. I don't honestly remember.

At that stage, 8 July, the CO make was 12.52. Did you note that at all when you came back?-- No, I didn't.

The graph would have been on the wall as per the normal practice?-- That's right, yes.

But it wasn't something you stopped and looked at when you came back?-- I can't remember if I did or didn't.

Were you aware at that stage of the parameters that were at least discussed by Strang and Mackenzie, and I think you referred to them earlier, 10 lpm was some cause for concern, that is, 10 lpm and above?-- That's correct, yes.

Some cause for concern?-- Some cause for concern.

And, of course, approaching 20, an indication of-----?-- Serious trouble.

Serious trouble?-- Mmm.

You were aware of that at that stage?-- Through my Mines Rescue training in '92, yes.

Was it something you kept at the top of your mind, or did you just file it away there somewhere and it would never come back into focus again?-- No, it was there, yes. It might not have been at the forefront, but it was there, yes.

Again, can I ask you this: was there much discussion amongst the management team that I mentioned before - managers and undermanagers and yourself - and even Cocky Morieson, who was ventilation officer - was there much discussion about this matter of CO make in 512 and the possibility of heatings and whether or not what was happening indicated a heating?-- Specifically with 512, or generally?

No, no, I'm talking about 512?-- No, there was not, no.

Was it the case that really this whole area of CO make was one that didn't assume all that much importance?-- I don't honestly know looking at it. It seemed - we did the CO makes and that was distributed - obviously people's perceptions had to be analysed and I didn't do that-----

But you say the CO make was distributed and graphs were done and all the rest?-- Mmm.

But there was a graph there when you came back from your vacation which indicated a level of 12.52?-- That's right.

In spite of the Strang and Mackenzie-Wood admonitions or indications, it didn't seem to be a point of any discussion amongst the management team at that stage that there was a level of CO make at over 12 and a half?-- No, there wasn't, no.

I mean, you didn't advert to it yourself?-- No, I didn't.

Do you think anybody else did on the management side from what you saw? First of all was there any evidence that they did advert to that, or was it just-----?-- I don't know if they had, but in the scheduling of the 512 panel it was ascertained we would not be there for more than three months. With that perception in your mind, you tended to put that to one side, you know what I mean? You merely put it to one side.

What you are saying is that because it was intended to have only a short extraction phase-----?-- The shortest we have had for at least four years, five years.

At 512?-- That's correct, yes.

Then everybody got a little bit more relaxed about any possibility of spontaneous combustion?-- I personally did, yes, looking back at it, yes.

And from the indications that came to you - that is, that nobody seemed to be adverting particularly to the CO make reading of 12.5 and there wasn't any particular discussion about smells and CO make readings in 512 - the other indications were that other people in the management team adopted much the same approach. They were fairly relaxed about this question of spontaneous combustion because, after all, they were getting in and out quickly?-- That was my perception. I can't speak for anyone else.

Anyway, any complacency that might have existed up to the morning of July 22nd at least was temporarily interrupted when Steve Byron and Peter Rose took a reading and reported 8 ppm up from 5 ppm the previous week; is that right?-- That is correct, yes.

Now, can you tell me what you remember about that day?-- Where would you like me to start?

I would like you to start when it was first reported to you?-- Yes, Steve Byron and Peter Rose came into my office on the Friday - it could have been just before lunch. That was the agreement that Mouse and I had - that he would collect the information and I would then transpose that information on to Cocky's data sheet and produce the graph for him to sign and distribute. When he came in, they were fairly jovial and said "We've got something here for you - something interesting for you.", and, you know, then proceeded to call the file up, and I inserted the parts per million and then to the velocity, and when I put that in, we got a - with the 8 parts, I then changed the litres per minute formula to take into account the 8 parts instead of the 5.7, which was a weekly average at that time. Basically analysing a worst case scenario - that spot reading, yes - and that gave us the 19 litres.

Or 18.62 at least at vent station 46?-- At vent station 46, yes, that's correct.

I told you about the 8 ppm. What exactly happened in relation to this incorrect velocity reading that's been referred to?-- Mouse read the three velocities out to me while I physically input them into just a little equation - just a - you know, X plus Y, divide by three - just an average - and the last reading was extremely high. I can't just recall what the number was at this point in time, but as soon as I entered the last reading and hit return, it just - I mean, it just didn't make sense. Peter Rose then went to the anemometer that was in Allan Morieson's room just around the corner and he had then taken it out of the box - out of the wooden box and he said, "Oh, we read it incorrectly. It is 1.77." I then proceeded to just to - because of the 8 parts, I just over-wrote the three averages and just put 1.77 in; again, a worst case scenario, I think, at that time, and that gave us the 18.6.

Okay. That incorrect anemometer reading - the one that had been recorded incorrectly, I mean - the reading wasn't taken incorrectly, what happened was that it had been transcribed incorrectly?-- It had been read off the dial incorrectly, that's correct.

That incorrect reading was never used to produce any calculation of litres per minute? That incorrect reading was never used to produce any calculation of litres per minute?-- No. From memory, I think it was something like 3.1 - 3.77, which was-----

It was quite clearly over the top and-----?-- That's right.

You got the right one pretty quickly?-- That's right.

Any error was quickly corrected?-- That's correct.

So that it couldn't be said that the incorrect velocity reading produced this higher litres per minute result?-- No, the actual 18 came from the 1.77, yes.

In fact, the higher litres per minute result that week really resulted effectively from the higher CO in parts per million?-- That is correct.

The average velocity was much the same as it was on any other occasion?-- That is correct.

Then what happened after that?-- I printed out the graph and printed out a table - a log table, and then Mouse - or Steve Byron actually signed it and Joe Barraclough, the acting manager at that stage, was in Allan Morieson's room, or the room next door, and we brought that to his attention - the steep rise in the graph from the previous weekly's reading to 19 - to 18.9 lpm.

Joe Barraclough was acting manager?-- That's correct, yes.

Of course, if you look at that Exhibit 21 - go back to the previous page. The reading on the previous week, 15 July, was 14.59; is that right?-- That is correct, yes.

Had you been aware of that during that week - after you had come back?-- I can't honestly remember. I most probably would have. I don't know why I wouldn't have, but I can't honestly remember.

What would you make of a reading of almost 14.6 lpm as a mining engineer?-- That was getting pretty close to the expected make that Allan said that we would achieve by the end of the panel.

Getting pretty close to it?-- Well, it would be at it - at the point.

Why do you say that? You were talking about 1 lpm?-- That's correct.

Increase per week?-- That's correct.

How many weeks had the panel been going?-- At that stage, I think about 10 or 11. I'm not sure.

It started at?-- It started at 2.

Or 1.24 - 28 February. Now, you are talking about 27 April; is that right - 1.44? I'm looking at the top of the - that first page of the CO make, 512?-- Yes, 1.44, 1.5. Between 1.5 and 2.

Why do you say-----?-- As a general - well, the reason why we tried to establish a base - what we were trying to do was to establish a base case for all the development panels in the operation and that's why we put the two readings in there to start off with.

The two readings? Oh, you mean the monthly readings?-- The two monthly readings.

I am talking about 27 April; there is a CO make of 1.44?-- 1.44.

That's when extraction started; isn't that what you told us earlier?-- That's correct, yes.

And it had been going for how many weeks?-- I don't know.

May, June, half of July, about 10 to 11 weeks?-- 10 to 11 weeks, yes.

And it started at one and a half. Even on that formula, what you would expect is around 12 - going for 11 weeks?-- 11 weeks.

What-----?-- On top of the two that we had already established that we were going in on on the development system. We were getting pretty close to this - that 14 litres per minute that Allan said was an expected make by the end of the panel.

And you weren't anywhere near the end of the panel at that stage, were you?-- No, no.

And it seems that the Strang and Mackenzie-Wood formula of being a bit concerned over 10 had gone out the window at this stage; is that right?-- No, it hadn't gone out the window. There was a natural CO make in the panel on pure development and maybe we were looking for some - you know, better - some better definition. We were still in the process of collecting information.

You don't think you were looking in the wrong direction when you say you were looking for some better definition, simply to accept Allan Morieson's - I'll call it an empirical assessment - that you might expect 1 lpm increase per week on top of the assumed 2 as a starting point?-- On an extraction phase, yes.

Then in accepting that you don't think you were too ready to - in looking for parameters - to just be ready to accept anything that was said that made you feel comfortable with the rate of increase?-- No, no. Well, I didn't - I was asking the question at the time. In the ventilation monthly reports dating - we were more than 18 months back - panels were developing an average - not that I calculated it - we calculated it, but there was a general CO make in the whole mine in different panels, even though they had not been used for quite a considerable period of time. So, when looking at the 10 litres, we said that the 10 litres on top of the standard development rate of natural oxidation of coal pillars would give us, by the end of the panel, around 14 litres-----

Why would you add your 10 litres on top?-- On top? That's what I'm saying. In the development phase of older sections in the panel that had been standing for 18 months, 12 months, we were - there was a general 2 lpm make in some areas. You know, it was just a very general assessment, but nevertheless it was an assessment. That's why, to try and refine this CO make process, we started to put the starting dates - the two - we tried to put some pre-extraction information in there to determine what our extraction panels would develop.

Did you carry out any further research either by way of comparing it with previous experience at that mine, or by way of consulting with somebody outside of the mine who might have had a higher level of knowledge and experience?-- This was the first time any other panel that we had - we had just started from start of extraction. This was the first panel where we were collating more data to at least be able to present to anybody or look at. I didn't have-----

Did you - sorry?-- We didn't have production statistics. You need to gather information before you can make an assessment. This was us in our infancy trying to generate some sort of a database to say what do we really expect.

Did you look at the records for 5 North which was sealed because of a heating?-- No, I did not, no.

Well, there were records there, and available?-- In the record book, yes.

And they would show that the CO make - sorry, that the CO readings in parts per million varied between 5 ppm and 8 ppm with a figure of 7 ppm the day before the sealing?-- This is in -----

In 5 North?-- In 1991?

In 19 -----?-- Or '86?

The sealing when it was sealed because of a heating, when it went up rapidly on the day of the sealing. I think that was in 1986?-- Sorry, the information that I had to collate for the inspectors, the '86 was significantly higher than that, I think.

You didn't do -----?-- But at that stage -----

---- any research on it?-- No, I didn't do any comparison -----

401 and 402?-- That's right.

Went to a maximum of 6 ppm over the life of the district?-- To 12 lpm if I remember correctly. I don't know the parts.

Well, you've got the graphs there that show you that. 401, 402 is in that Exhibit 21; is that right? 6 ppm on 7 January 1994?-- On 7 January, yes.

7 January 1994, calculating to 12.43?-- That's correct, yes.

Then 511 went to 5 ppm?-- That's correct, yes.

All of that information was available?-- Yes, it was available.

Just on 511, that went to a CO make of 7.79 - sorry, 8.95 seems to be the highest there. All of that was available?-- It was available, yes.

Did you think it would be wise to look at other panels to see what you might expect rather than just to accept this formula that seemed to be pulled out from nowhere that you might expect 1 lpm per week increase?-- The type of mining extraction that we were doing in the 512 was very different to any other rib stripping method that we had utilised.

It exposed more coal?-- It exposed more coal and that was what was said to me.

That had two side-effects; one is that - well, two side-effects have been referred to, one that you, I think, have referred to, that because there was more coal exposed you

might expect a higher rate of oxidation producing more CO?-- That's correct, yes.

Did you ever take any steps to consult with any expert independent of the mine to see whether it was a reasonable expectation?-- No, I didn't.

The other side-effect that it had, of course, was that it may well have created a situation where a heating was more likely to occur because of all the loose coal?-- That is the other side, yes.

Now, you were talking about the reading the previous week, that's 15 July 1994, 14.6?-- That's correct, yes.

I think you were saying you can't recall whether you did specifically advert to that -----?-- Or not. I -----

----- during the week. Did you become aware of it as at the 22nd when this very high reading of 18.98 came out?-- The issue on the 22nd was 19 as an absolute number.

Yes, but did you advert to how high it was the previous week?-- I can't recall if I did or if I didn't, but I'm sure I would have had to have looked at it.

If you had seen the 14.6 the previous week would you have been concerned by that? I don't know that you've actually answered that for me?-- With a lot of the CO graphs that were available the peaks and trough that we see in the system is purely dependent on how the mining was actually being conducted over that period of time. I don't know if I would have seen it or not, or I can't honestly remember if I did, but -----

Would you have been concerned at a level of 14.6?-- I would have been, yes.

That's really the area that I'm interested in. I know about the peaks and trough and I know that there might be ways that you might seek to explain it, but if you'd seen the 14.6 you say you would have been concerned by that?-- I would have asked questions, yes, but -----

Would you, as a mining engineer, even relatively inexperienced - and I don't apologise for that, I think you would concede that yourself, at that time you were relatively inexperienced - as a mining engineer, if you had seen 14.6 would you have ensured that there was some kind of investigation to see what it was that might be producing that?-- As a mining engineer I would have, yes.

What would you do? How would you have that investigation carried out?-- Well, basically to go back down and have a look at the panel and take further readings like we did on the -----

What would you do to have a look at the panel?-- What would you do?

When you say go back down and have a look at the panel, what sort of look at the panel?-- You would try to investigate the goaf to find out if you were getting increased makes or parts per million from specific areas.

And as a mining engineer, having regard to all the difficulties in getting into the goaf, how would you go about that?-- You wouldn't be able to go very much further past the top return stoppings.

But, of course, most of those stoppings between 1 and 2 roadways have little windows in them?-- Doors or some sort of windows, yes.

I'm just interested in what you would do if you were down there investigating, perhaps by reference to the plan up there. How would you go about it? How would you go about it? You've got 14.6, you are a bit worried that there might be a heating. As a mining engineer common sense tells you you've got to get down there and find out what it is that might produce that sort of make. How would you go about it?-- You would go to the last line of cut-throughs where you could possibly go to, where they were mining, and investigate the goaf edge and then I would travel down the No 1 heading and look into every stopping door or window that I could find to the bottom of the panel. At the different doors along the way in the No 1 heading you would take representative samples of the atmosphere in that area down the No 1 heading.

What about across the back?-- Yes, you would go - if you had access across the back. I never actually traversed the back of -----

The panel was specifically constructed with a set of reasonably large pillars left at the back so as to provide for number 13 cross-cut?-- That is correct.

For the specific reason of giving access across the back?-- That is correct, yes.

And I suppose the reason why it would be designed to give access across the back is to enable people to go along there and have a good look inside and see what's happening in the goaf?-- That is correct, yes.

Is there any reason why you wouldn't go along the back?-- No, you would go along the back.

And you'd have a pretty good look at those roadways, wouldn't you?-- You would, yes.

Is there any sort of instrument that would help you if you were down there looking for a heating?-- The Probeye. That would be one instrument.

There would be an element of chance with it?-- Very much so, yes.

Because you do have to be able to focus it, as we understand it -----?-- That's correct.

----- on the area of heating; isn't that right?-- That is correct.

In order to get a response to the infrared ray?-- That is correct, yes.

But, of course, some chance is better than no chance; isn't that so?-- That's correct, yes.

So if you were doing a thorough investigation as a mining engineer you would probably take a Probeye with you?-- Yes, you would, yes.

To increase your chances?-- To increase your chances of finding something, yes.

You might even -----?-- Yes.

Given the percentage area of the goaf that you could have a look into through the roadways, through all these doorways and across the back, you might increase them by even 30 per cent?-- Yes.

40 per cent?-- You could see at least that cut-through width in anyway.

And there was a Probeye available at Moura No 4 or at the - is that right?-- In the monitor room there was a Probeye there.

Sorry, in the monitor room at No 2?-- At No 2, yes.

Did that ever go down the mine with you?-- No, it didn't go down with me.

Or with anyone else, Allan Morieson or any undermanagers or -----?-- Not that I'm aware of, no.

Was it just in the monitor room for decoration or what was the position?-- I don't honestly know if it was operational or not. I can't comment.

Have you ever used one?-- No, I haven't.

Do you know if Allan Morieson has ever used one from your own knowledge?-- I know it has been taken underground, but I cannot specifically remember by who or who was involved.

Having done all of that, and perhaps even used your Probeye down No 1 heading and across the back, is there then anything else you would do in relation to ventilation or in any other way in order to try to isolate gases coming out of particular areas within the goaf? Is there anything along those lines that would suggest itself to you as a mining engineer trying to isolate an area of heating?-- To isolate it and confine it and maybe remove it, that it -----

To isolate it first of all -----?-- First of all, yes.

----- to discover whether you can locate it?-- That would be the preference, to isolate, identify and possibly remove or extinguish, that is - yes.

As a mining engineer what do you learn about how to isolate a heating in a goaf? I'm only a lawyer, you see, I don't know these things. Can you tell me what instructions you might be given or what you might learn in the course of your studies?-- I wasn't educated in any of those techniques in the course of my study. I only remember Pommer telling us the stories of how they physically dug the hot - you know, that area out and removed that from the mine. I'm also aware of the Ladell - I think it's Ladell incident where they actually grouted pillars, they drilled holes into pillars and grouted them. Obviously for any major type of heating you could possibly inertise the goaf whether it be with an inert gas or water.

But in terms of locating it in the first instance was there anything that you have learned in any of your studies or experiences about how you might locate a heating?-- Your parts per million was what I - would be my first indication, a really high parts per million from a specific location.

Would there be any way of ventilating the goaf so as to, as it were, flush out evidence of a heating?-- You could close off other areas of the mine by restricting the splits - air flowing in alternative splits you would increase the quantity of air that you would run through the specific panel to identify it that way.

And take readings at particular points?-- And take readings. You would have your Unor set up to do continuous readings for you, yes.

Anyway, there were means available, as far as you knew, to get down there and try to locate the source of a heating?-- Yes.

Or any heating that might be the source of the carbon monoxide?-- The source of carbon monoxide.

In any event you, on 22 July, as far as you recall, hadn't particularly adverted to the 14.6 the previous week but you were conscious about this 18.98 or 19 -----?-- As an absolute value, yes.

Now, you did tell us earlier that you had those discussions with Joe Barraclough; is that right?-- That is correct, yes.

And what was decided at that stage when you first spoke with Joe Barraclough?-- Well, Joe had decided that he wanted to monitor it a little bit closer by doing daily readings and he asked me to construct a log so that we could keep an eye on those readings.

He wanted a log done on the Lotus system?-- He wanted a log. He didn't specifically say -----

But of the same kind as you had previously?-- I did that, yes.

Was that something he decided at that stage of the day, this was before any contact with Dave Kerr or anybody?-- That is correct, yes.

He wanted it done daily or each shift or what?-- Daily.

And did that then become a situation where it was to be done each shift?-- For that weekend, yes, that I was aware, yes.

For that shift -----?-- For each shift over the weekend, yes.

The idea in any event was to produce a graph with daily readings on?-- To produce a log.

A log with daily readings on?-- That's correct, yes.

Which could then be plotted on a graph. You nod your head -----?-- Yes.

The purpose of that graph would be to show, as it were, spot readings, not the weekly average business, but spot readings each day; is that right?-- Yes, on the log - Joe never asked me to produce a graph. That graph was produced on my own initiative.

But if you are going to produce a log, having regard to the way you had set up the Lotus system, the obvious thing was that you wanted to translate your readings on to a graph so that you could look at a graph and see where it was heading?-- That's correct.

You spoke with Joe Barraclough; did you go and set that up straight away?-- I went to set that up, yes.

Was Steve Byron with you when you spoke with Joe Barraclough?-- That's correct, yes.

Later in the day did you have conversations with someone else about it? Who was the undermanager there at the time?-- On shift, on day shift?

Yes?-- I can't honestly remember.

Was Terry Atkinson there?-- He was on the next shift, afternoon shift.

What about on the day shift? Did you have any conversation with any undermanager that day about it?-- No, I didn't, no.

Was it the sort of thing that you would do, that you would raise with an undermanager?-- At that particular time I raised the issue with Joe and he went forth, I don't know, maybe to discuss things with Mr Mason and the undermanager on shift to organise whatever readings they had to take.

What was the next thing that happened from your point of

view?-- From my point of view, at 3.30 that afternoon I went to see Mr Mason in the office next door. I walked into the office and Dave Kerr was in the office with him and they were talking about something and I just pulled myself out of the door and went back to my office. Then at four o'clock I went in again and then at that stage I had the log and the graph in my hand and asked - was there to ask George if we had got any readings from the 18 to either find out what actually happened or, you know, what was -----

It would be readings from the -----?-- From the vent

station.

From the vent station?-- That's correct, yes.

That day?-- Yes. I was under the assumption at that stage that we would do - that we would do a second reading to verify that point, to verify what was - what had been obtained that morning.

Had you arranged with anybody that there be some verification of it?-- I hadn't, no. I was expecting someone to have done it and then for me to collate - to table that information.

As far as you knew -----?-- As far as I know, yes.

----- the reading of 8 ppm was a reading that was done properly?-- Well, as far as - at that point, yes, I assumed that it was done properly, yes.

Steve Bryon was an experienced deputy?-- He was.

You had no reason to doubt his capacity to read a Drager tube?-- No, I didn't.

Why was it that you assumed that there be another set of readings for that day?-- Those - if you had readings like that, it is advisable really to double check them, to keep a closer eye on them, and if further investigation was required, to go further inbye of the vent station into the panel.

Well now, of course, one thing you can do is go down and take another set of readings?-- That is correct, yes.

But even if you take another set of readings at some stage later in the day, that may simply indicate that whatever was there and giving that reading earlier in the day is no longer there, isn't that right?-- There is a possibility of that, yes.

So, by the mere fact that there was a reading of 8 ppm taken by an experienced deputy, wouldn't that be sufficient to prompt some further investigation, not just another set of readings?-- Well, part of the other set of readings would be to go down and investigate what was happening down there. That was an assumption on my behalf.

Well, you didn't do that yourself?-- It wasn't up to me to delegate people to do those jobs, no.

Well, you say that you went in with the graph and the readings?-- That's correct, yes.

Which graph was it that you had at that time?-- The graph that I would have given Mr Barraclough in the morning.

That was the one showing the higher reading?-- That's correct, yes.

And what happened when you went in?-- From what I can recall, Dave Kerr asked me what sort of Drager tubes we were using and I told him we were using the high range Drager tubes.

At that stage had the mine only been using the high scale tubes?-- That I was aware of, yes.

There were no low scale tubes kept there?-- There were no low scale tubes kept in the fridge that was in the room next door, no.

Anyway, Dave Kerr went off and got some low scale tubes and he came back; is that right?-- That is correct, yes.

He had some low scale tubes with him?-- He returned with some low scale tubes, yes.

And you went down to 512 with Dave Kerr and Terry Atkinson; is that so?-- That is correct, yes.

And when you got there what did you do?-- We went to the monitoring station inbye the prep seal, or I thought it was, and proceeded to take an air velocity and a number of Drager tube readings inbye of the seal.

How many readings did you take at that point?-- I think we took about three Drager tube readings and then I took two velocity readings because they were just about so close you didn't need to take a third one.

What sort of tubes did you read, the high scale tubes?-- No, I used the anemometer to take the velocity readings. It was David that took the -----

You didn't take any actual Drager tube readings?-- I didn't take any Drager tube readings, no.

You make some comment in your statement about the low scale tubes being more difficult to read than the high scale tubes?-- That's correct, yes.

Can you say why that is?-- The high scale tubes were of a - like a purpley darker stained colour and that was a little bit more easy to - you could identify that a little bit easier than the greener scale in the low scale tubes.

A bit easier to see where the colour actually faded out?-- That's correct, yes.

Although the low scale tubes would certainly have had a broader calibration?-- That's correct, yes.

So that you might more easily determine just at what point, whatever colour it is, whether it's greeny or purpley -----?-- The green was a very - it was a very pale green and that's what - that's the reference I make to in my statement, the pale green was just a little bit more difficult to read, yeah.

The readings that were taken there at that point, what were they?-- They were between 5 and 6 parts.

So, there were - I am sorry, two?-- There were two or three tubes taken, Drager readings taken, yes.

Then where did you go?-- We proceeded inbye to where the - it was an area where we had taken some bottoms between 5 -----

How far in?-- Between - it would have been between 5 and 7 cut-through, somewhere in that vicinity.

What happened there?-- We - Dave then took some more Drager readings and they came up with exactly the same result.

They were just taken in the top return?-- In the top return.

Not through any of the holes in the - or the doors or windows in the stoppings?-- No, they weren't, no.

Is there any reason why there wasn't some investigation in behind the stoppings?-- Well, we were only registering 5 to 6 parts which was a normal scenario.

But you had had a reading of 8 ppm earlier that day taken by an experienced deputy?-- Prior to me going underground I went into - when I asked Terry if he would come down with us -----

Terry Atkinson?-- Terry Atkinson. I went into the Unor room and brought forward the previous day and the current day's recorded values. On each - on all those recorded values we had not - the Maihak had not identified any 8 parts for the entire day. This was while Dave was away, so it would have been between 4 and 5 o'clock in the afternoon. I had then gone to George while I was waiting for Dave. The general discussion was to say, well, what did - what actual reading did happen down there? Was it a Maihak problem or was it a Drager tube reading problem? We weren't sure of that, so that's -----

Sorry, who wasn't sure of it?-- Well, I wasn't at that stage.

You knew that the reading that had been taken earlier in the morning -----?-- At 8 parts.

----- was done on a Drager tube?-- That's correct, yes.

I don't quite understand what you are saying, that you didn't know whether it was a Maihak problem or a Drager tube problem?-- Well, whether we had got 8 parts in the morning with a Drager tube and hadn't picked it up with the Maihak or vice versa.

But, you see, my point is that you had a reading of 8 ppm taken by an experienced deputy?-- That's correct, yes.

I think you agreed earlier - and that 8 ppm calculated through

to about 19 lpm?-- That's correct, yes.

I think you agreed earlier that even at 14.6, as a mining engineer even of relative inexperience, that you would get down there and you would investigate in order to find out whether there was a heating. Now, at 8 ppm calculating through to 19 lpm, why wouldn't you do the same? I mean, you had no intrinsic reason to doubt the reading of 8 ppm, isn't that so?-- No, I couldn't question that, no.

It didn't show up on the -----?-- It didn't show up on the Unor, no.

It didn't show up on the Unor system that day or the previous day. Even the average over the previous week was down around 5.5 or something?-- 5.5. Well, the weekly average for that was 5.7, yes.

But that in itself wouldn't give you an intrinsic reason to doubt the 8 ppm, would it?-- No - until it was verified, no.

Until what?-- Until you could verify that you were getting 8 ppm. If you had got 8 ppm, there wasn't much time in the day between 12 o'clock and 4 to - if there was something happening down there, you would still have -----

Why do you say that? Why do you say that?-- Well, if you have a heating in the - if you were developing 8 ppm at your vent station, you would assume that you would continue to get that 8 parts over that short period of time.

Why would you assume that?-- Well, you don't just - I cannot remember if there were any ventilation changes made, but that's what you would assume.

But that's one of the problems, isn't it? There is no record of ventilation changes; you don't know what's happening with ventilation from one end of the day to the next, did you?-- No, I didn't know, no.

Reece Robertson was the deputy that day. Did you - I am sorry, yes, he was the deputy that afternoon, I should say?-- That's correct, yes.

Did you speak with him or with the deputy on the previous shift about any ventilation changes that might have been made?-- No, I didn't.

You see, having regard to this design of the panel where there are larger areas - and I think you agreed with me earlier that there were larger areas of goaf created on extraction?-- That's correct, yes.

Given the fact that there were substantial falls in some areas?-- That's correct, yes.

And you were aware of that?-- Yes, I was, yes.

Given the fact that there was an abundance of loose coal which

may well have been under the fallen areas or even in areas of ventilation shadow or dead areas of ventilation that might be associated with these larger pillars, given all those things, why would you dismiss the prospect that there might be some heating there and that the ventilation might pick up some of the results of the heating at some stage but not pick it up consistently?-- My only answer to that is because when I looked at the Unor it never registered any 8 parts all throughout that day.

Well, let me come to the Unor. The Unor samples - well, when I say "samples", the Unor actually is taking in the atmosphere from the monitor station on a continuous basis, isn't that so?-- Yes.

And when that atmosphere proceeds through the tube to the surface to the sampling point, then on the normal operation one minute in 13 minutes of that atmosphere is sampled, isn't that so?-- Until this Inquiry I wasn't aware of that, but, yes, that is the case, yes.

Well, we will come back to your state of knowledge, but let's deal with your state of knowledge as it is now. So, if there was some picking up of an atmosphere containing carbon monoxide by ventilation which is passing but not passing consistently through perhaps a questionable area of ventilation in the goaf and this sample then of the goaf atmosphere which contains carbon monoxide from some heating in that area moves outbye to the vent station, right, why could it, or why could it not be the case that that sample containing the carbon monoxide passes through there within the 13 minute time frame; that is, in a space of time less than the 13 minutes? I mean, you are not getting a totally homogeneous mixture of atmosphere coming through past your vent station at all times, are you?-- I don't know. I couldn't really answer that honestly, or can't answer that. I don't think that's my field.

You don't think it's your field?-- I have not analysed that, or been able to analyse that, but you would assume that you would get a continuous flow of goaf gases over at least a period of time, not just in plugs.

Why not? Why couldn't you get a plug?-- You could get a plug, but - well, I don't know what ventilation changes, if any, were made on that day, so I can't answer that honestly - not honestly I can't answer that with all the facts.

What about having regard to your knowledge of a heating and how it might behave? Are you saying that it consistently gives off a certain proportion of gas or certain proportion of mixture of gases?-- In my terms I would have assumed if you had a heating - once a heating has been generated you consistently - you would have a consistent rise - either a rise or maintain a stable production of gases out of that heating - either a rise or a -----

Wouldn't that depend on the amount of ventilation that's passing over? The amount of oxygen, first of all, available

as fuel - the amount of oxygen that passes through that provides fuel for the heating?-- But the goaf was always positively ventilated, you see?

It is, but you have been in Court when you have heard evidence of the possibility of dead areas in association with the compartment pillars. Do you agree that - I thought you agreed earlier that there was -----?-- No, I didn't agree.

That there was a prospect of some dead areas of ventilation?-- No, a low velocity.

Let's call it a low velocity?-- It sounds better than "dead", yes.

That's a relative matter, isn't it?-- That's correct, yes.

So, we will call them low velocity areas, and I think you agreed also that there might be falls?-- There were falls, yes.

That restrict ventilation?-- I don't know if they restrict. I couldn't - I had never mapped a lot of the falls in there, but there were areas that had falls, yes.

Well, let me ask you then: do you think that a fall might restrict ventilation to some extent over the areas that might be concealed under the fall?-- It would restrict ventilation under the fall?

Yes?-- Yes, it would, yes. When you said "restrict ventilation", you still have a cavity over the top of every fall to allow ventilation to flow over.

But where the material's fallen, for a start, that tends to split the air that's coming down the airway?-- It does, yes.

A great majority of the air will pass over the top of the fall?-- That's correct, yes.

Some of the air might pass under the fall?-- Could do, yes.

Because it is not going to be sitting flat on the ground?-- That's right.

There could be piles of coal under there - the loose coal - some heaps of loose coal under massive blocks of sandstone?-- That's correct, yes.

And do you agree that those areas - for instance, under the fall - might be poorly ventilated?-- Yes, yes.

And do you agree that all of these factors may lead, first of all, to a difference in the rate of production of carbon monoxide from a heating because of changes in fuel - that's the amount of oxygen passing over the heating, first of all?-- As a layman, with regards gas sort of development, I'd have to say yes, but I don't know if I'm qualified enough to say at what percentages or - but generally speaking, if you starved a fire of oxygen, it will drop, or if you raised it, you could propagate it, yes, and that would give you a different gaseous make.

That's right. Of course, raising the amount of ventilation over the fire might, on the one hand, tend to provide more fuel, but on the other hand might have a cooling effect?-- Correct, yes.

So, all of these things lead to an unpredictability in the rate of production of carbon monoxide from a particular heating?-- That's correct, yes.

So, to get back to what you were saying, you can't sit there and confidently say that you are going to get a consistent rate of production of carbon monoxide from a particular heating, whether it is a big one or a small one?-- No, you couldn't - you might not, no.

So, can I come back to my question, then: why do you dismiss the prospect of their being a plug of carbon monoxide picked up by ventilation which passes through an area which might, for the most part, be even poorly ventilated?-- I was under the assumption that that atmosphere that was pulled through the Unor tube was continuous, so you would have some representation of that sample through the Unor line to be analysed, wouldn't you?

Okay. So, if the representation that comes through the Unor line is a representation that's shorter than 13 minutes-----?-- You could miss it altogether.

You could miss it altogether, or you could pick up one part of it?-- Yes.

Couldn't you?-- Yes, that's correct, yes.

And if one part of it is picked up and mixed with the rest of the sample that doesn't have that part of carbon monoxide, you end up with a diluted sample of carbon monoxide, don't you?-- That is a possibility, yes.

There is probably a way this could be represented graphically, but you understand what I'm saying about part of a plug of carbon monoxide could be picked up in the Maihak?-- Yes.

Or part of it missed; or if it is short enough, in fact, it may be missed altogether?-- There is a possibility of that, yes.

If it is only 10 minutes long, you know, you could probably even calculate the odds of it being missed altogether, but we won't attempt to calculate the odds, okay - isn't that so?-- Yes, that's right.

So, coming back to the question of how thorough an investigation you should carry out against the background of a reading of 8 ppm, what I was putting to you is that you couldn't dismiss that reading of 8 ppm simply because the Maihak was only showing you an average of 5.5; isn't that right?-- That is correct, yes.

Righto. So, we are back down there with Dave Kerr and yourself and I think it was Terry Atkinson; is that right?-- That's correct, yes.

And we are looking at just what you three did down there on the afternoon of the 22nd. You didn't look in through any of those doorways and take readings. You did take some further Drager tube readings between 5 and 7-----?-- 5 and 7 cut-through, yeah.

What did you do after that?-- We then proceeded to the surface.

Did you go any further inbye?-- No, we didn't go further inbye.

Didn't go along the back of the panel?-- No, we didn't.

Did you suggest you should take some readings back down in cut-through 13?-- Yes, I did, yes.

And what happened?-- They - to physically do that on that afternoon?

Yes?-- No, I didn't suggest that that afternoon, sorry.

Was there any reason why you didn't suggest you should go down and do that?-- Like I said, at that time my - the way we thought - the way I thought was the 8 parts hadn't been - had gone through the analyser, or through the Unor system - we basically questioned the 8 parts. So, at that stage we went

down to verify what was happening down in that return and verify that the Maihak either was or wasn't giving the correct reading.

Let me suggest to you, Mr Abrahamse, that when you went down there that afternoon, that as a group you were really fairly well disposed to dismissing the 8 ppm that had been found in the morning?-- I was - we had to verify that, but it did enter - yeah, it was: "Where did that reading come from? Was it a default tube?"

That doesn't really answer my question?-- No.

You were fairly well disposed to dismissing the 8 ppm reading that had been found in the morning?-- The facts were that we didn't have that registered on the Unor, and that's what gave us the impression, yes, that that 8 parts was an incorrect reading, yes.

That was the main factor for you?-- That was my main factor, that's right.

Nothing had registered on the Unor at any time near 8 ppm?-- That's what raised the question, yes - "was it a true reading?"

So, you were really elevating the Unor above this system of taking Drager tube readings week by week and even, from that point forward, shift by shift?-- The CO on the log parts per million and CO on the Maihak was a good cross-referencing to check the two. You know, that's what actually - that's what resulted from the incident on the 22nd. We had a high reading of parts on the Maihak and that initially - well, you asked the question, "Well, what is wrong?" It alerted us to the fact that maybe there was - either one or the other was not operating the way it should be.

Well, I'll put it to you this way: that when you went down there to check this 8 ppm on the afternoon of the 22nd, you really went down more with a view to dismissing it than with a view to investigating a panel that might have given a reading of 8 ppm?-- We didn't go down to investigate the internal heating of the panel, no, if there was a heating.

And yet would you agree that subsequent events might well give some real historical - perhaps retrospective support to a reading of 8 ppm at that time; do you agree?-- Yes, I do agree, in hindsight, yes.

That's a reasonable proposition, isn't it-----?-- That's correct, yes.

-----whatever heating was in there, given all that we know about readings?-- That's correct.

Just prior to sealing, and even right up to the time of the explosion, whatever was in there was not a heating that just came about in the few days prior to the sealing; would you agree with that?-- In hindsight there was something going on

down there, yes.

Now, when you first saw Dave Kerr that afternoon, you had some conversation with him about the reading earlier that day, did you - about the 8 ppm reading or the 19 lpm?-- I can't remember exactly. I only remember exactly him asking me about the tubes or that, but I did have the graph and the log in my hand which I'm sure I would have said to George or-----

He suggested that what you told him was that there was a high CO make calculated earlier in the day?-- Mmm.

But that that was calculated because of an 8 ppm and a false anemometer reading?-- Correlating the - oh, right.

That's what he says - that you told him that there was a high CO make, which resulted from an 8 ppm reading of CO combined with - or together with a high anemometer reading. Now, do you remember telling him anything like that? Sorry, a false anemometer reading, not a high one - a false anemometer reading. Do you remember telling him anything like that?-- I can't remember exactly if I said that, but I know I would have said something about the - how we got to the 18 parts or 19 parts, you know. I can't remember exactly-----

I mean, one thing is clear: you didn't get to the 19 parts because of any false anemometer reading?-- No, it was based on the 1.77.

I'm just wondering how Dave Kerr became aware of some false anemometer reading and associates that with your explanation as to why there was a high reading in of CO make?-- I might have said in conversation that the third reading that they took was read incorrectly, you know.

Did you make out to him that that might have been responsible for the high CO make calculation?-- No, I honestly can't remember if I did or didn't. I'm just-----

Well, it certainly wouldn't have been correct if you did?-- No, it wouldn't have been correct, no.

You don't know whether you did or didn't? You weren't in a frame of mind you wanted to discredited the 8 ppm?-- When I saw Dave I had not looked at the Unor readings at all.

Were you in a frame of mind you wanted to discredit the 8 ppm? I mean, it was a bit of a problem for you, wasn't it - the 8 ppm?-- In what regard?

Well, the 19 - perhaps the 19 litres per minute was a bit of a problem because it really set your graph on a continued upward trend that would have indicated that there was some real problems in the panel?-- If that was true, I wouldn't - sorry, I don't understand your line of questioning.

I'm just saying that the 8 ppm which calculated through to a CO make of 19 was really a problem which you would prefer not to have?-- It raised alarm bells in my head in absolute terms

that if that is the case, there is something wrong down there, yes.

And if there was some way that you could find to explain away the CO make of 19 parts - 19 litres per minute - then you would have been happy to find it; is that right?-- No, I don't think so, no. I wouldn't have done that.

I'm not suggesting any impropriety?-- You're not?

MR MORRISON: Yes, you are.

MR CLAIR: I mean, you are there, you've got a reading that indicates a CO make of 19 - almost 19 lpm?-- That's correct, yes.

Now, what I'm saying to you is that if it were so - if that were so, then there would be a problem that would need to be investigated right away?-- That's correct, yes.

Now, I guess the best way to put it is you would no doubt have been very relieved if you could see an explanation for that 19 parts - 19 lpm being incorrect?-- If that was the case, I would be relieved, yes.

So that all I'm saying to you is that your disposition was probably such that you would have been more ready to see an explanation for the 19 lpm than you might have been otherwise - more ready to find an explanation for it than not to?-- Sorry, I was only looking at the facts on that night.

Okay, righto. Could the witness see Exhibit 93, please, Your Worship? You would have seen that document referred to here in evidence, Mr Abrahamse?-- That's correct, yes.

That's the graph that ends up with a two way path from the 15th to the 22nd. What would seem to be the first of those is a path that leads upwards to that reading of almost 19?-- That's correct, yes.

With a question mark beside it?-- That's correct, yes.

Is that a line that you plotted on the graph?-- That's a line I drew on the graph after coming out of the hole.

And you put a question mark there?-- That's correct, yes.

And is that the graph that you've referred to that you drew that day, the 22nd, and had in your hand when you went into George Mason's office?-- No, it's not.

Isn't it?-- No.

When did you draw this graph?-- This graph was drawn after we had come out of the hole.

Which graph did you have in your hand when you went in to see George Mason?-- I'm sorry, I don't have that graph here, but there is a graph that has not got all those dates on it. The last date is dated 22/7 and has a line from - that goes up to that point.

Do you know where that graph is? Have you seen it here in court?-- It's part of inspectorate documents, isn't it?

A line that goes up to that point and stops, is that what you say?-- Yes.

It's one that's spread outright across the whole of the graph area?-- That's correct, yes.

You say it doesn't have any further dates on it. Could the witness see Exhibit 110, please, Your Worship? It's the second document from the front; is that so?-- That is correct, yes.

Was that a graph that was of the same kind as the one produced normally on a weekly basis?-- Yes, the signature at the bottom underneath Allan Morieson is Steve Bryon. The writing on the side is mine with my initials at the bottom, yes.

So you had that graph, that was one that had been in effect produced by your normal Friday procedure?-- That's correct, yes.

When Steve Bryon was there did he do this procedure on the Lotus system or did you tend to do it?-- Beg your pardon?

When Steve Bryon was there replacing Allan Morieson did he do the procedure on the Lotus or did you tend to?-- No, I input

the values, yes.

You then used that graph - just so I can be clear on this - you used that graph there to produce the document which is Exhibit 93, that is you have allowed for more dates along the bottom of the page, but in effect it's -----?-- When you construct - when I - that evening after verifying the between five and six parts I - when we created the extra log for that - that Joe requested on a daily basis those dates then automatically went to the column - little table on the right-hand side which automatically extended the dates on the graph. I produced that after we had come out and because - with the 22/7 at around 14 litres - and I physically drew that line from 15/7 up with a question mark in in pencil as an indication for Terry Atkinson to be wary of.

Now, that was after Dave Kerr had left that you did that; is that right?-- That is correct, yes.

Just before we go to that, was there anything more that occurred before Dave Kerr left. After you went down you did the investigation down the top return, you went to see Reece Robertson; is that right?-- That is correct, yes.

Do you recall any particular conversation with him?-- The miner, I think, was between - the crib room was at one cut-through, the miner was between - I think in 3 cut-through on the - just on the belt road, off the belt road downhill. We went and saw Reece and he confirmed the five to six parts that we had - we basically went and told him what we were doing. I can't remember exactly if we said about the incident on day shift, but we just said that - I'm not 100 per cent sure on that, but I know we said to him that when we come back from the return we could only register between five and six parts and he said, yes, that is what he got at the beginning of his shift.

You say in your statement that you all concluded there was no cause for concern?-- At that point, yes.

Did you resolve in your mind at that stage how the 8 ppm had come about in the morning?-- It was up in the air. I didn't -----

Was there any explanation that suggested itself to you?-- A possible explanation is a faulty tube.

Is that -----?-- That would be about one of the only things. The 21/31 was the same one that we used and we went to the monitoring point inbye the seal. So the fact that maybe the tube - there was something faulty with the tube could be the only thing that could possibly be -----

Did you discuss with anybody or carry out any research as to the likelihood of a faulty tube?-- No, no, I didn't, no.

Did you think a faulty tube was very likely?-- A possibility.

A possibility, you say?-- A possibility.

But that's as high as you put it. On the basis of there being a possibility that it was a faulty tube you effectively put it to one side, the 8 ppm reading?-- I did, yes.

Except for at least registering it on the graph -----?-- That's correct, yes.

----- to be fair. Now, what sort of discussion did you have with Dave Kerr about it? Did he express any views about how the 8 ppm in the morning might be explained?-- No, he didn't, no. I can't recall if he did or if he didn't, but I -----

Did anybody say anything to Dave Kerr about any earlier concerns in the panel? I suppose you weren't aware of anything to cause concern earlier because you had been away on holidays?-- That's correct.

There was nothing said in your presence that suggested -----?-- Nothing said in my presence, no.

You went back to the top and you recalculated the CO make based on the Maihak weekly average figure?-- Yes.

5.7 ppm?-- The first thing I did was I went to the Unor room. Roughly an hour had passed by the time Terry had completed an inspection in the panel, and then a few other things on the way out, to have a look at the Unor system to see what was actually reading that afternoon - the time period that we were down the hole. I can't remember exactly the figure that was on the screen. I didn't call up anything, I just looked at the screen to identify what parts per million were there, but it was between five and six and that satisfied me to say that, well, that's what we recorded, you know.

Now, you had some conversations with Terry Atkinson, did you, about what was to be done over the weekend?-- It was my understanding that we were going to maintain - continue this monitoring on a daily basis. Therefore it was my - on my - not direction, my - I basically said to Terry once I had the graph plotted and drew the line up there that, "When you fill out the log, if you see any rises such as that one there with the question mark next to it, make sure you get in contact with somebody."

Would it really need to be a rise of that significance before you need to get in contact with somebody?-- Well, it was a figure - it was something concrete that I could physically show him, you know. It was just if it did that get on the blow horn to somebody and tell them what was happening, and I just asked him if over the weekend -just to plot a few points.

To plot a few points?-- Yes.

What, shift by shift you mean? When you say "plot a few points", did you -----?-- No, I was under the impression it was going to be on a daily basis.

On a daily basis. You then produced these documents - and I will just take you to this before we finish - these documents that were, in effect, set up to record then on a daily basis the CO make in 512. The first document that you produced off the Unor system and your Lotus system was Exhibit 95 there, is that right, the one you've got in front of you?-- I've only got 93.

Well, 93 will do. Exhibit 93; is that right?-- That is one document, yes.

And the other one, if the witness could see Exhibit 94, please, Your Worship? Just before we leave 93, 93 was in fact a graph that was plotted up to the 22nd and which provided for daily points to be plotted right through to 2 August; is that right?-- That is correct, yes.

Now, Exhibit 94, the first page of that is - it may only be one page - Exhibit 94 was a document that you prepared with a lot of blank spaces in it to be filled in to provide for daily readings at vent station 46; is that right?-- That's correct, yes.

Those readings being the velocity, wet and dry temperatures and then the gas readings including the parts per million; is that right?-- That is correct, yes.

With a view to calculating the total CO make?-- That is correct.

And again that page provided for entries to be made right through to 2 August?-- That is correct, yes. 2 August has - when I was asked to produce a daily table, that is - 2 August is all that would fit on that page. There wasn't any significance to 2 August.

But 2 August -----?-- Is the last date.

Just where the page finishes?-- That's correct, yes.

No doubt you would have intended to keep producing?-- If required, yes.

You will see that it's set up in the format whereby it has provision for vent station 46 and vent station 59?-- That's correct.

But the 59 is crossed out and 46 written in?-- That is correct, yes.

Did you do it that way?-- No, I didn't. I had put both vent stations down at that stage.

And that's because that's the way it came off your Unor system or came off your Lotus system?-- That sheet is basically the start of page 2. Page 1 was full, this was the start of page 2, 22/7.

And it's only as it's been progressively filled out that

somebody has crossed out vent station 59 and put in 46 so that you get in respect of the days that have been filled in there, in most cases you get two readings a day at vent station 46?-- That is correct, yes.

Tomorrow I'll ask you some more questions about that document there. Just before we finish though, can you say when was the last time you saw that document prior to the explosion?-- The last time I saw this document was the week before the explosion, between Monday and Friday, somewhere on the undermanager-in-charge's desk in a blue folder.

In a blue folder?-- In a blue folder, yes.

Do you know how it got on to his desk?-- No, I was - I was away for four days from 26 to 29 July.

And where was it when you went away?-- I had looked at the readings on the Monday when I returned to work. On the Tuesday or Monday night I became sick and I never returned to work until the following Monday and then it was between that Monday and Friday somewhere that I - that it was on the desk.

But when you -----?-- I placed it in the undermanager's office.

Before you went away?-- Yes, the Monday, yes. It was in the - on the undermanager's desk, yes.

That's an appropriate point, Your Worship.

WARDEN: Thank you, gentlemen. 9.15 tomorrow morning.

THE COURT ADJOURNED AT 5.01 P.M. UNTIL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 14/02/95

..DAY 25

THE COURT RESUMED AT 9.16 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

WARDEN: Mr Abrahamse, you are on the oath that you took yesterday; do you understand that?-- Yes, I do.

You are on the former oath, thank you.

MR CLAIR: Now, Mr Abrahamse, when we finished yesterday we had been looking at the situation that you set up at the end of Friday - or that was set up by the end of Friday, 22 July for the shift by shift or daily recordings at least, daily recordings of the figures to calculate the CO make in 512?-- That is correct.

And provisions for a graphing of a daily point?-- And the provisions for one, yes.

Those documents that you produced -----?-- That is correct, yes.

You produced those on the Friday?-- On the Friday evening, yes.

You gave them to Terry Atkinson; is that what I understood?-- I put them in a blue folder and gave them to Terry Atkinson.

He was the undermanager on shift during the weekend?-- That is correct.

Your instruction to him was to keep an eye on the CO make over the weekend?-- That is correct, yes.

I think you said that what you told him was if there was any steep rise equivalent to what might have been seen on the Friday with a higher point being read, any rise like that, to get in touch with you and to get in touch with someone?-- That is correct, to get in touch with the undermanager in charge.

Did you instruct him that it was to be a shift by shift reading or simply a reading each day?-- No, I was not aware that it was a shift by shift at that stage.

You heard nothing on the weekend yourself?-- No, I did not.

You came back on the Monday?-- Yes.

When you came back on the Monday you did see the documents?-- Yes, I went to the undermanager's office first up in the morning, yes.

Perhaps if the witness could have those exhibits that he had at the end of the day yesterday, Your Worship, Exhibit 93 and

94. Now, when you saw the documents on the Monday they were still in the blue folder?-- That is correct, yes.

And some entries had been made in each of the documents?-- That is correct.

Exhibit 94 first of all, that's the table?-- Yes.

Are you able to say what had been entered on to that one when you saw it on the Monday?-- No, I couldn't determine an exact location.

There were figures there -----?-- There were figures there, yes.

----- for the Saturday. Were there figures there for the Sunday too, do you know?-- There is - I did put an entry on the Monday.

Yes. What was that?-- Where - the notation of "one fan operation".

For the Monday?-- For the Monday, yes.

Opposite the 9.2?-- That is correct, so I would assume it would be from there up. That's what I would have saw.

Now, when you saw from there up, from there up would mean that all the Monday entries were in there too; is that so?-- That would have to be correct, yes.

So when you saw it there were entries there for the Monday?-- That is correct, yes.

Being two sets of entries for the Monday?-- No, just the one, the one in blue pen.

I can't see it there?-- Sorry, the 1.74 velocity, 6 ppm both Maihak and Unor.

I see. What you are saying is that you put in the whole of the second line for the Monday including the "one fan operation"?-- That is my handwriting, the "one fan operation", and looking at those numbers, that's the way I write my seven, with a little hat on it. That's the only way I recall putting that in.

Now I understand what you are saying, that everything above that line where "one fan operation" appears was already there when you saw it, and as far as you can tell you put in the whole line?-- That is correct.

Finishes with the note "one fan operation" which was in fact the second reading for the Monday?-- That is correct, yes.

Were the final columns filled in for the weekend showing the total CO make in litres per minute being 13.88 and 13.57 respectively?-- That is correct, yes.

And against the background of what you've said that didn't cause you any concern, I take it?-- No, that reaffirmed what we had obtained on the Friday evening.

And the 7 ppm on the Monday, the entry that you put in there, that was also - well, let me ask you this first of all: the 7 ppm, when that was calculated through with the much lower velocity of 9.2 - I'm sorry, with the much lower velocity of only one metre, it looks like, that came to a CO make of only 9.2; is that right?-- That is correct, yes.

But in fact the parts per million at seven was higher than what had been previously?-- That is correct, yes.

Did that cause you any concern?-- No, it didn't. Looking at the litres per minute, the reduced litres per minute, reduced velocity through the panel, because only one fan was operational you would expect parts per million to increase slightly.

That would apply to the Maihak just as it would to the Drager reading?-- That is correct, yes.

Was that one fan operation something that extended for a considerable length of time or was that only a very temporary break in the fan operation?-- The Monday was a production down day. I'm not quite sure what actually had to be done to the fan on that particular occasion, and I'm not too sure how long it was down for.

Now, you then left the documents in the blue folder?-- That is correct, yes.

On the Monday after you had put in that entry?-- On the Monday afternoon, yes.

On the Monday afternoon?-- That is correct, yes.

As I understood what you said yesterday afternoon you took the blue folder and you gave it to whom?-- I left - I would have left it on the undermanager's desk.

Left it on the undermanager's desk. You didn't actually give it to anybody or speak to anybody about it?-- No.

Did you speak to anyone about the new regime for taking measurements of the CO make in 512 on the Monday?-- No, I had not, no.

Did you see any directive yourself that was published by anyone in the management directing deputies to take the full set of readings on a shift by shift basis?-- No, I did not, no.

Did you ever see that?-- No, I did not, no.

You were absent then for the next four days?-- That is correct, yes.

When you came back, you told us yesterday afternoon that you did see the folder again?-- That is correct, yes.

On the undermanager's desk, did you say?-- I'm not 100 per cent sure. I'm not sure.

Perhaps you said you thought it might have been?-- I'm not sure.

Was it still together with the graph?-- The two pieces of paper were in the folder, that is correct, yes.

Can I come back then to that graph? On the Monday the 25th did you see the graph in conjunction with the table on that day?-- Yes, on the 25th I looked at both, yes.

Did you do anything in relation to the graph yourself?-- No, I did not, no.

Did it have these further lines on from 22nd to 23rd and 23rd to 24th?-- Yes, that was already on there before I looked at it, yes.

After you had come back from your leave, from your four days leave, and you saw the documents together then did you look at the table to see what further figures had been put in?-- I can't remember if I actually saw the folder on the Monday or some time during that week. I think it was - I remember seeing the folder, the blue folder, in the last week in the undermanager-in-charge's office and looked through it then, but I don't remember seeing it - I don't think I remember seeing it in the undermanager's office as such on the Monday morning.

When you did look through it did you look to see what further details had been put in on the table?-- I did look, yes.

And did you see the further figures that are on the document there now?-- There were only an additional two rows of figures put on that table, yes.

That was for Tuesday the 26th?-- That is correct.

Did you also look at the graph at that time?-- At that time, no, I didn't, I don't think.

When you looked at the further figures you would have seen first of all a CO make calculation on the first reading for 26 July of 16.25; is that right?-- I don't know if I interrogated the document, but the 16.25 is in the column, yes.

Let me ask you, do you recall seeing the 16.25?-- No, I don't recall seeing the 16.25.

If you looked at the document you would have looked at it, no doubt, to see how things went after you went on leave?-- That is correct, yes. On the Monday that I returned I did ask the question, asked the question of Mr Mason in the morning what

had come of the log or - not of the log, of the instant on the 22nd with the parts per million and he just said that the Unor matches up with what readings we are getting down underground and they are between five and six parts. On that Monday morning, because I was away on the Friday which was the - I think the 29th, because I was away on the previous Friday I then got Mr Bryon to give me the results that he had obtained from the previous Friday and that was consistent with what the readings were on that Monday to the Friday.

But that then ignored this earlier arrangement that there

would be a monitoring of the CO on a shift by shift basis or a day by day basis, at least as far as you were aware, in 512?-- That is correct, but I was not aware -----

It was just ignored, was it?-- I don't know if it was ignored, but I wasn't made aware to table it as such.

But you had already decided back on Friday the 22nd that you would table it?-- It was asked of me to draw up a log so that the recordings could be taken, yes, and I gave the log - put the log together, yes.

And really nothing particularly useful happened?-- No, it didn't. The parts per million remained constant as I was told.

Well, it didn't really, did it? It didn't really remain constant?-- Between 5 and 6 parts I was led to believe.

Well, for a start, the graph was plotted for two days and that was all; is that right?-- That is correct, yes.

Nothing further happened in relation to the graph?-- That's correct, yes.

Which was to be what we would call the really useful document to show what was happening progressively in the section - nothing happened about that at all after the Sunday, two days after the arrangement was put in place; that's right, isn't it?-- That is correct, yes.

As far as the table went, at least that was completed up to the Tuesday, the day after you had gone off sick?-- That is correct, yes.

And it's not correct to say that in fact the CO in parts per million stayed between 5 and 6, is it, because on the Tuesday there is a reading of 7; the first reading on the Tuesday was 7 ppm?-- That is correct, yes.

With a velocity of 1.81, and I think we established earlier in evidence that if that was calculated correctly, it would in fact come to 16.66 instead of 16.25. Were you here when that evidence was given?-- I most probably was, yes.

I won't go through the exercise now, but even putting aside that in fact it should calculate to 16.66, what was entered on the table was a CO make of 7 and - sorry, CO reading of 7 ppm and a CO make of 16.25. When you saw the document, did that leap out at you?-- No, I -----

And as a result you -----?-- No, I didn't interrogate the document.

Well, it almost would interrogate you, wouldn't it? There's 7 ppm and there is CO make of 16.25. It's asking you the question, isn't it?-- Yes.

Isn't it in fact asking you to go down there and do what needed to be done, that is, take all the steps that an experienced mining engineer would take to isolate the cause for this production of carbon monoxide, isn't that so?-- Yes, if I had interrogated it, yes.

And in fact it would have asked that same question of anybody - anybody - who had looked at that document during the time that you were away, isn't that right?-- Yes, I would have assumed so, yes.

You weren't the only person who was supposed to be monitoring what was going on in 512 Panel, were you?-- No, I was not.

There were undermanagers?-- That is correct.

Who at least should have seen this document. Even if they didn't, they should have, because that's the reason for which it was created, isn't that so?-- That is correct, yes.

There was the manager who, in effect, had set up the whole procedure; is that right?-- That is correct.

For more frequent monitoring of 512 Panel?-- The daily readings, yes.

And, of course, there were the deputies too who took the readings?-- That is correct, yes.

Although there is some reserve there because not all of them could calculate it through to the CO make, first of all; is that right?-- There would be some that couldn't, that is correct, yes.

And perhaps it's true to say that not all of them were made aware of the significance of the CO make in litres per minute?-- There were some that would not, that's correct.

Well, in any event, just coming back to that, the 16.25 against the background of what had happened back on 22 July should have been ringing very loud alarm bells, shouldn't it?-- It should have, yes.

You came back from your leave, you had what appeared to be a very cursory look at the document and you left the folder where you found it; is that right?-- That is correct, yes.

Effectively confined to the corner of a desk?-- That is correct, yes.

Where nobody bothered to do anything about what it contained?-- That is correct, yes.

In spite of the fact that by that time, that is, during that week - and you are not sure just when it was you were looking at it - by that time there were the higher readings in CO parts per million coming through again during that week; is that so?-- I was not aware of it at that stage.

Perhaps we can come to that at a later point. Now, I want to leap forward in time a bit while we are talking about these two documents because initially when the inspectors went to take possession of all of the relevant documentation at the mine, and in fact ended up in possession of a considerable body of documentation, it seems that these two documents which have been in the blue folder were not amongst the documentation that they ended up with?-- That is correct, yes.

Do you know why that was?-- After the event there were - the whole room was papers flying everywhere, there was a fair bit of confusion, and those papers, whether they would have been still on the desk that the team used would have just got all lumped together somewhere.

Which team are you talking about?-- The incident team.

From the mine?-- The inspectors and the Moura team, yes, during the incident itself. They used that - the undermanager-in-charge's room.

There were plenty of other graphs that ended up in the possession of the inspectors; is that right?-- That is correct, yes.

Of all of them, given what had occurred back on the 22nd and then after the explosion with the benefit of hindsight, it would be reasonable to suggest that of all of the documents these two were really almost up at the top of the list of important documents, isn't that right?-- At that stage for me to collate all those documents, I was on the understanding that those daily readings had ceased from that point there that was on the log because we had already - because we had ascertained that that 8 parts that Steve Bryon obtained on the Friday could not have been possible, and, therefore, with that being calibrated I assumed - this is me assuming - that maybe - that no-one was taking daily or shiftly readings as was the case.

There are two things, though, in what you say there. The first is that you didn't really demonstrate that it was impossible for Steve Bryon to have got a reading of 8 ppm, did you?-- It is not impossible, but the facts didn't verify that.

You were ready to accept that there was some error in respect of the 8 ppm is a better way to put it?-- That is correct, yes.

But you certainly didn't demonstrate that it was impossible?-- No, not absolutely impossible.

Well, let me suggest this: to demonstrate it was impossible would have taken a far more thorough investigation of the 512 Panel than you and Dave Kerr and Terry Atkinson carried out that afternoon -----?-- That is correct, yes.

----- isn't that right? Okay. So, that's the first comment,

but the second comment is that you really had no basis to assume that the daily or shiftly readings had ceased because on the Monday when you came back at least it had been done up to that point; is that right?-- I was not aware of that, no.

On the Monday - I am talking about Monday the 25th when you were there for the day?-- Oh, Monday the 25th, that's correct, yes. The information on the log, that is correct.

So, it had been done up to that point?-- It had been done up to that point, yes.

And the graph had actually been plotted on the weekend too?-- That's correct.

And we know that subsequent to that there was a directive by the management that deputies were to take readings of all information to calculate the CO make on each shift, so we know as a fact that that occurred. You may not have known that?-- That is correct, yes.

But when you came back again from your sick leave and looked at the blue folder, you did find that there were more figures on the document than there were when you had last seen it?-- Yes, the next day, yes.

Including a reading of 7 ppm calculating to 16.25 CO make?-- That is correct, yes.

So, let me ask you again: isn't it the case, given all the things that were being produced to the inspectors, all the graphs that were being done and all the work that was being done by what you call the incident team, isn't it true that these two documents here which were historical documents, that is, they showed what knowledge was in the possession of the mine; secondly, they showed that there had been sufficient concern about the CO make in 512 as to set up a provision for a daily plotting of a graph as from 22 July - showing all of those things, being, as I say, historical documents in that sense, what I am putting to you is that they were documents which were towards the top of the list of important documents, that is, that they were very significant and important documents?-- They were obviously important documents but-----

Well now, can you explain how they were overlooked?-- No, I can't explain how they were overlooked. We supplied all the information to the Inspectorate that we had on file. Where those were, I wouldn't have known.

It seems that they were somewhere with the documentation that the mine had and was aware of because they were produced in the course of the hearing here last year?-- That is correct, yes.

After a search that had been conducted overnight here in Gladstone, isn't that right?-- That is correct, yes.

Were you part of that searching procedure then?-- I wasn't part of the searching procedure, but I know we brought

countless boxes of information from the mine and they were found in one of those.

And it seems that sitting in one of those countless boxes was this blue folder with these very important documents in it?-- That is correct, yes.

Now, just before I leave that point, you would concede, wouldn't you, that the existence of these documents is an embarrassing matter?-- It is, yes.

For all of those - not just you, but for all of those concerned in the management of the mine in the time leading up to the explosion, isn't that right?-- It is correct, yes.

Embarrassing in a number of ways: one, that it shows that concern existed about the CO make in 512 some two and a bit weeks before the explosion - that's the first thing; is that right?-- That is correct, yes.

Embarrassing in the sense that a system was established in light of that concern to monitor the CO make closely?-- That is correct, yes.

And particularly embarrassing in that the system lasted only two or three days basically?-- That's what I was aware of, yes.

Now, you say in your statement - I don't want to canvass this at length because we did cover it to some extent yesterday - but you say in your statement in respect of the CO make trend graph for 512 that the CO make was generally greater than previous panels, although the trend in increase is consistent and similar to other panels. Can I ask you this: did you carry out an exercise at the time, that is, before the explosion, to see whether in fact the trend in increase in CO make was consistent and similar to other panels?-- No, I did not.

Is that something which you are saying in retrospect?-- In retrospect, yes.

Do you still hold with that - that, in fact, the trend in increase was consistent and similar to other panels, or is it just a broad, sweeping statement?-- It was a very broad, sweeping statement.

It is fair to say if you sit down and look at all the figures, that's not really true, is it?-- No, that is true.

The level is different and the rate of increase is different?-- The rate of increase is different, yes.

You go on in your statement and you say, "We surmised that the extra CO make could well be as a result of the loose coal left because of the system of ramping into the bottom coal and the greater surface area of exposed coal." This is the point that we touched on yesterday?-- That is correct, yes.

Now, I mean, it was only a surmise for a start; is that correct?-- That's correct.

It wasn't based on any research?-- No.

Or inquiry of somebody with any greater expertise in these matters?-- No, it was not.

It was really, to some extent, just based on something that Cocky Morieson and yourself had discussed; is that right?-- That is correct, yes.

And a sort of round-hand, off-the-cuff estimate from Cocky Morieson that you might expect an increase from month to month of 1 lpm?-- That's correct.

Against a background that, in fact, you had pushed up to 2 lpm?-- That is correct.

Against an actual reading of 1.44 - around about the time that extraction commenced?-- That is correct.

If we just examine that surmise for a moment; if that were correct - that you could expect an increase over time of CO production as a result of the method, and that you might expect it at a higher level than for other panels, then you would expect that that increase would continue throughout the life of the panel?-- That is correct, yes.

There would be no reason - there would be no reason at all for a decrease in the CO make?-- That is correct.

I mean, it would make nonsense of the theory, wouldn't it, to - make nonsense of the surmise, if I can call it that?-- Yes.

If there was a substantial decrease in CO make?-- A substantial decrease, yes.

If there were a decrease you would be scratching your head and

saying, "How the devil can we have a decrease when we are exposing more coal all the time."?-- That is correct, yes.

Let's have a look - have you got Exhibit 93 there still?-- No, I haven't. I beg your pardon, yes, sorry, 93.

93 is in front of you, is it?-- Mmm.

That at least shows us the position then up to - well, take it up to the 22nd?-- Mmm.

Now, if you look at that, you have, first of all in May, between the 13th and the 20th a moderate decrease. You might disregard that; is that so? I mean, you wouldn't regard that as throwing any doubt on your theory; is that right?-- That is correct, yes.

You have a moderate decrease between 27 May and 3 June?-- That is correct, yes.

Much the same scale as the previous one - perhaps even a little bit less. But then you come to 11 June, and you have a plunge from the 11th down to the 16th, and that's the only way it can be described, isn't it?-- That is correct, yes.

Well, did you find yourself scratching your head at this stage and saying, "Why have we got this massive decrease in CO make."?-- Like I said before, in the 401, 402 panel it wasn't uncommon - and the 511 panel - it wasn't uncommon to obtain these peaks and troughs, so to speak, and that was purely determined by the system of ventilation at the face - whether they were on the right-hand side or the left-hand side of the panel, that would allow more air to go right throughout the goaf. So, we had experienced those peaks and troughs.

Well, we will have a look at-----?-- I don't actually know what occurred on - between the 11th and the 16th as such.

Well, it is certainly something that's quite out of keeping with the rest of the general trend on 512; isn't that right?-- It is a drop in CO make, yes.

It also occurs from a reasonably high level, up around 12, and it comes down to - well, in fact, we have the figures there - I'll give you the exact figures. It comes down from 11 June - 11.61 goes down to 7.32 - perhaps it will be better if you have the figures in front of you and for that purpose I would ask that the witness see Exhibit 109, please, Your Worship and Exhibit 21 at the same time. We will need to come to that shortly. Go to the third page in Exhibit 109. You will see there the weekly readings - the weekly reading for 11 June - if we can call it a weekly reading - it is interposed between the 10th and the 16th, but that's a reading of 11.61, and five days later it is down to 7.32?-- That is correct, yes.

And they are the points that are plotted on the graph that you've just been looking at. Well, as I was saying to you, did you ask yourself the question at that time as to why it should plunge as much as that, and is that the sort of

difference you would really expect to be created by different ventilation?-- I can't honestly answer that question because I wasn't there during that period, but when I did return, when you look at the graph from when I returned, like I said before, we had experienced peaks and troughs and that could just be a - for some reason maybe a regulator would have been shut down in another area of the mine which could have flushed the goaf. I don't honestly know what occurred during that period.

It could have flushed the goaf?-- It could have flushed the goaf, yes.

If it flushed the goaf, you are saying it might produce this higher reading?-- That's correct.

On the 11th?-- It could have flushed the goaf on the 11th and then that air - this is surmising - I am surmising - it could have been maintained for that week to drop it down to the low parts per million.

That's-----?-- There was - just one moment. I mean, the Maihak indicated there was 3.6 parts on that particular occasion in the top return.

Yes, that's right. On the 16th?-- That's right, compared to the 5 the week before, or - yeah, on the 11th.

So, what you are saying is that changes in ventilation might well lead to these different readings in CO parts per million; is that right?-- Yes.

That's precisely what I was putting to you yesterday when I was putting to you the proposition that you could have a heating in an area of the goaf that's producing CO but because of the way the ventilation is behaving, the CO is flushed out at some times and not flushed out at others. Remember I was putting that to you yesterday?-- Yes, there is so many variables, I can't say whether more air would fan something or take it away. I don't know. I'm not-----

You see, what you have just put to me is one of the variables?-- One of the variables, that's correct, yes.

That is, that you get a low CO reading because the goaf has been flushed out; isn't that what you are suggesting?-- That's a possibility.

Let me take you to the other side of the coin?-- Yep.

These are important variables, because they are the sorts of variables that require investigation at the time, you see?-- Yes.

Let me take you to the other side of the coin, and that is that you could get a low CO because changes in ventilation have led to certain parts of the goaf where CO is being produced not being properly ventilated. That's the other side of the coin to what you suggested?-- That's correct, that's

another variable, yes.

You know if you had done a bit of an investigation when you had this drop around about 16 July - 16 June, what you would have found is that, indeed, there were parts of the goaf that were not being properly ventilated at the time - do you know that? You have been here when the evidence is being given?-- Yes.

Have you ever put that two and two together?-- Yes, as an alternative.

MR MORRISON: I am going to ask Mr Clair - I am objecting to the way he is putting the questions. He is of course entitled to follow this line, but he knows, as well as we all do, because he sat through the evidence too and adduced it from Mr Morieson, that when he talks about 16 June in comparison to 11 and 10 June, he adduced from Mr Morieson that 10 and 11 June was when the area was flushed and he is making no reference to that, and including in that the matters put forward and that skews and makes twisted the factual basis upon which he is asking this witness to proceed. Now, he also knows that that question was addressed on 10 and 11 June by Mr Morieson and he adduced that evidence himself, and yet none of that is being included in the factual assumptions, and this proceeds on that basis, which is really quite an incorrect basis, because the comparison now being drawn is an equally false one, because the comparison being drawn is what the ventilations shown were on, for instance, 22 July, and he knows, as we all do, because he introduced the evidence himself from Mr Robertson, that there were no ventilation changes that occurred that day, but the two comparisons being sought to be made are really on a quite incorrect factual basis. We can waste a lot of time in this Inquiry, as we no doubt already have, following dry gullies that don't really matter, factual points that don't matter, investigating things that won't lead to recommendations in the future leading to safe mining practice, but it would be advisable and appropriate if we did put forward correct factual bases if we are going to ask witnesses to comment upon them. It is just not good enough that we go along with this approach where you can put a preferred set of facts without the full set of facts. We spend hours discussing it, getting witnesses to elaborate on their views, only to find when we read the transcript later on that the full set of facts haven't been put, so we have just wasted a bit of time and it has occurred before in this Inquiry. Those who have read the transcript will understand, and I really would ask our learned friend to try to confine himself to all of the facts, and not just some of the facts. We will save some time if we do that.

MR CLAIR: Well, Mr Morrison has just made a contribution to wasting some of the time of the Inquiry, Your Worship.

MR MORRISON: I object to that gratuitous, editorial sort of comment. I won't put up with this nonsense. We have had people trying to make headlines in this Court before, let's not have it again, especially from counsel assisting. I raise an important matter and it is not good enough to have it

responded to in that fashion.

MR CLAIR: Your Worship, Mr Morrison raises what he says is an important matter against the background of suggesting that I am putting factually incorrect material, and if there is any basis on which somebody might be resentful, I think that's an appropriate basis. If I could continue my line of questioning, Your Worship, which I submit is a justifiable one against the background of the evidence that has been put, then it might well demonstrate that there is no incorrect factual basis for it. If Mr Morrison somehow wants to put some other slant on the material in due course, he will have his opportunity.

WARDEN: Thank you.

MR CLAIR: Might I continue?

WARDEN: Yes, you may continue.

MR CLAIR: Thank you.

What I was putting to you, Mr Abrahamse - if an investigation had been carried out around that time of the 16th or 17th of June, what would have been discovered is that, in fact, there was an area of the goaf that wasn't being properly ventilated at that time. Had you ever realised that yourself?-- No, I had not.

Well, do you recall Mr Robertson telling the Court about an occasion on 17 June when he spoke with the off going deputy, Bob Newton, and Bob Newton told him that there were troubles with methane on the tranny supply road, the No 2 heading?-- I remember Mr Robertson being in court, yes.

And you remember all the evidence about Mr Robertson and Mr McCamley and Allan Morieson doing a substantial check in the No 2 heading?-- Yes, they said they did that, yes.

And finding that there was layering at the top of No 2 heading?-- That is correct, yes.

You remember Mr McCamley's evidence about that?-- Yes, I do, yes.

Mr McCamley saying that he smelled, in fact, a slight tar smell. He describes it as a very slight tar smell in the area around 9 cross-cut in 2 heading?-- I remember him saying that, yes.

Do you remember his evidence about his in fact going right out into the goaf?-- I certainly do.

You see, I just want to make sure that you've got in mind the correct body of evidence when I refer to this, and all of that evidence indicated that at that time on 17 June there was an area of the goaf that wasn't being properly ventilated; isn't that so?-- The triangle - the bottom triangle of the section, yes, I remember that.

And steps were taken then to change the ventilation to flush that out?-- Yes, that is correct, yes.

Weren't they?-- Yes.

And in fact if you look at that Exhibit 109, at the third page that we have just been looking at, that would tend to support that what you had, if I can take you back to, say, 3 June - and we are dealing with vent station 46 - 3 June you've got 3.2 ppm. I'm looking at the Maihak here?-- Yes.

Or you've got three parts on the reading - we'll go through each. Three parts on the Drager tube reading, 3.2 on the Maihak for that day?-- That's correct, yes.

For 10 June, the next week, you've got a Drager tube reading of five and a Maihak reading of 4.5?-- That is correct, yes.

Is that right?-- That is correct.

On 11 June, the next day, there is again a Drager tube reading of five and a Maihak reading of five?-- That's correct.

Is that right?-- That is correct.

Which shows a build up of your CO; is that right?-- Over the week, yes, half the part increase, yes.

And then you come through to the 16th and what you've got is a - you've got a Drager tube reading of five and you've got a Maihak reading of 3.6?-- That is correct, yes.

And on that occasion what would have been used to produce your CO make in litres per minute?-- 3.6 would have been used.

The 3.6, and that gives you the low CO in litres per minute of 7.32?-- That is correct, yes.

And at the same time you had a Drager tube reading of five which would have given you, of course, a much higher make in litres per minute, wouldn't it?-- Yes, would have given you around the 11 -----

Around the 11?-- Just looking at that, or approximately, taking into consideration the velocity which had actually dropped from 1.59 to 1.4, so roughly 11 without a calculator to add that up.

What I'm suggesting to you is that situation is really quite consistent with some area of the goaf not being properly ventilated if you take the 3.6 on the Maihak?-- Yes.

That was used to calculate your litres per minute make?-- That's correct, yes.

Whereas at least the Drager tube reading, it seems, might have got you closer to the mark as to what was happening in the panel?-- That is correct, yes.

And then, of course, those steps are taken after the 17th when these difficulties are found with the ventilation, steps are taken to clear that area; is that right?-- Yes, yes, that would occur.

The next week on your Maihak you've got 4.5 of CO?-- That is correct, yes.

And on the Drager tube reading, 5.5, a higher reading even than the Drager tube reading the previous week?-- That is correct, yes.

Which would tend to suggest that the steps that were taken to cure the problem with ventilation, the layering that was there on the 17th, have in fact flushed out more CO; isn't that what appears to you -----?-- Over that week that's obviously what would have happened, yes.

Just to be clear on this, I'm not suggesting anything to you that's nonsense on what you see here or on what you've heard of the evidence; is that right?-- No, I don't think you are.

And that continues then, if you go through from those figures on the 24th through to 1 July, you are up to 5.4 on the Maihak?-- That is correct, yes.

If you were to have examined that at the time, if you were to have scratched your head and said, "Why have we got this lower

reading of CO this lower CO make demonstrated on the graph using the Maihak figures?", then a thorough investigation using all the information that was available then, that is the reports by Robertson, the reports by McCamley, what Allan Morieson himself had seen that day, using all that information the picture that would have come out of it is that there was CO being produced in the goaf that was then flushed out when the ventilation was changed to overcome the problems in the No 2 road; isn't that right?-- That is correct. There is also nearly three weeks of coal production in that period of time too though.

Well, that's so?-- Yes.

But if it was simply coal production that was producing the CO then you wouldn't have expected the drop, would you, not a drop of that magnitude?-- No, not of that drop. No, there was an alteration in the ventilation for sure.

You can put that to one side. You've got Exhibit 21 there; is that right?-- That is correct.

If you go five pages from the back of that we come to the document that was produced, it seems, in a retrospective examination of the events leading up to the explosion. Have you got that one there? It's the second page of the CO make table for 512?-- Yes, that's correct, yes. Dated the 18/8, is that right?

It's got Allan Morieson's signature there?-- That's right.

Over 18 August 1994. Now, I did canvas with you yesterday your view about the CO make in 512 and the explanations for it and you've told us about your views on the short life of the working of the panel?-- The short life of the panel, extraction life of the panel, yes.

And also about the exposure of the coal, CO from that. Now, they were views that you held at the time that the panel was being extracted?-- At the beginning of extraction panel I asked the question, yes.

You were part of the subsequent investigation after the explosion?-- That is correct, yes.

Was this document here produced as part of that investigation?-- That is correct, yes.

Who produced the document?-- This particular document?

Yes?-- Well, Allan and I sat together and it was my intention - I had found out that the very last reading that had been taken on the weekend was by Mr Neil Tuffs, that's why I noted it down the bottom of the page, last reading taken by Neil Tuffs at 8.30 p.m. with a bit of a definition of the status of the seals with the belt road one metre from the roof and the top supply road and bottom - and the top return road open. That was Mr Tuffs' comments to me, that was the last possible reading that we could get out of the goaf.

So you put that note on there?-- I put that note on, yes, that's correct.

Your purpose in doing that was to somehow explain the CO make of 16.66?-- That is correct, yes.

That resulted from that reading?-- Just to signify that while we were collating this information, what information was around.

Can you tell me why the document was done in the form that it was, that is where it showed first of all the two readings for Friday, 22 July? Were they deliberately included on this document?-- No, they -----

Did they just happen to be there because this document was a continuation of -----?-- No, they were existing there from the 22nd. That was evidence in Exhibit 94.

You don't need to explain that further. They were already there?-- They were already there.

As part of your weekly document?-- Yes. Like I said, Allan Morieson for his own - to show that he had done - had taken action on - if there was something that happened underground and - his accountability. When we talked about accountability, if there was something that happened underground he would put a second reading in to show that on his graph that he did something to check inadvertent readings. So I did exactly the same, put the a.m. and p.m. reading in there.

For some reason though we have a reading for 23 July put on to this document?-- That is correct, yes.

Why was that?-- That was - on the Monday, the 25th, that was again putting a second reading in after the 22nd to verify that what we had obtained on the Friday evening was verified that weekend. It was just a check. This was set up for a weekly tabloid. By the time - that again was just to reinforce that we had checked it that weekend, you know. That's all that was. So I had put that in on Monday the 25th and that's -----

You put that one in yourself?-- That's right, and that's where Steve Bryon in his statements in the court said that he saw the blue folder in my end office that morning.

Then there is Friday the 29th which was the next weekly reading?-- That is correct, yes.

And then -----?-- And that was put in on Monday the 1st.

The following Friday, 5 August, is then put in; is that right?-- On that date, that's correct, yes.

That was the weekly reading?-- That is correct.

And there wasn't at any time any calculation of CO make from figures that had been obtained -----?-- No, there hadn't -----

----- and entered up from the graph here?-- No.

Even during this exercise after the explosion you didn't think it was appropriate to incorporate into this document calculations of CO make during that week, for instance, up to 5 August?-- No, I only became aware of the actual deputies' reports consistent from 22nd onwards while I was here in court. I only realised that they had recorded their values on a shift by shift basis then.

Then we go to that final reading on 6 August which you say - did you put that reading -----?-- Allan and I sat together during the two weeks after - or however many weeks after the incident, we sat together collating a lot of information. One of those was sitting there putting this - the last page together with the notation down the bottom and then him signing it. I don't - he'd have to be there with me putting that in for him to sign it.

Yes, okay. Was there any reason why you put in that one at the end of the Saturday, that's the Tuffs' reading, without putting in the others, the other readings that had been taken on the Saturday by the other deputies earlier in the day?-- At the time I did that Mr Tuffs gave me that reading and I put that into the documentation. Albert Schaus then asked me to look for what possibly happened over the weekend and that is another document that was submitted to the inspectors, the readings, deputy reports readings from the Friday to the last reading that I had input into that table.

Now, at some stage there was this other page produced which did actually put in the readings for the Saturday?-- That is correct.

That's the first page of the document; is that right?-- Last reading that I had input into that table.

Now, at some stage there was this other page produced which did actually put in the readings for the Saturday?-- That is correct.

That's the first page of the document; is that right?-- That's correct, yes.

Now, when was that done then in relation to the production of that document we have just been looking at?-- That would have been done after that document was produced.

And who did that one?-- Allan and myself.

Allan and yourself did that one?-- We did -----

Where did you get - sorry, you were about to say something?-- Yes, I was asked to collate that information and Allan at that stage had gone to the deputies' reports and pulled out this information from the weekend, from the Friday to the Saturday.

So he was aware of the deputies' reports containing these sufficient information to calculate the CO make, but you weren't?-- But I was not. The weekend, I just - he just had that information. Because the readings were fairly sporadic I just thought, well, some of the deputies were doing a good job during sealing. I honestly did not know that it was asked to do that before, two weeks before.

You didn't know it had been done on every shift?-- No, I did not know.

You thought these were just produced as a result of some haphazard action as -----?-- After Friday, well, looking at Mick Caddell's report of noting a strong tarry smell, from that I thought people were doing - taking regular readings or someone might have asked - Michael might have asked them to take regular readings towards the end of the panel.

What was the last shift you worked before the explosion?-- Friday day shift.

Did anybody have any discussions with you that day about any concerns about the CO make in 512?-- I calculated the CO make on the Friday from results that Steve Bryon actually gave me on the Friday afternoon.

That's the 14.26?-- That is correct, yes.

If you look at that first page of Exhibit 21 you find that at 12.45 a.m. on the Saturday there was in fact a CO make, when it's calculated through, of almost 19?-- Rob Newton's report?

Yes?-- Yes, that is correct.

18.94. Did anybody contact you to have any discussions with you about that?-- No, they did not.

And 10.15 a.m. the same morning, CO make of 21.04?-- That is correct, yes.

Again nobody ever contacted you about that obviously?-- No, they did not.

As far as you know these weren't even calculated before the event?-- I did not - I was not aware of them.

Obviously if you had been aware of it you would be very concerned?-- Yes, I would.

Very concerned?-- Yes, I would.

Again, if you had calculated some of the figures through from

deputies' readings that had been taken during the previous week, you would have found that on one occasion there was a CO make of over 19 - about 19.35. Nobody ever raised that with you?-- No, that wasn't raised with me.

On another occasion, 1 August, CO make of 18.93. That was never raised with you?-- No, it was not, no.

But again, if those calculations had been done either by you or somebody else under this system that you had been at least party to establishing, you would have been extremely concerned, wouldn't you?-- Yes, I would have, as I was on the 18th - on the 22nd when we reached 19.

The fact that you would have a series of high readings like that would have exacerbated your concern enormously?-- It would have, yes.

Of course, there was some considerable reliance on the Maihak system which is why these Drager tubes readings tended to be ignored; is that right?-- That is correct.

Did you -----?-- They weren't ignored but -----

Well, they were being taken on a shift by shift basis and they weren't being calculated?-- Well, I don't know why they weren't.

Well, you had been party to setting up this system?-- That's correct. On the Monday we were still between 5 and 6 parts, the reading that Steve Bryon gave me for the Monday the - for the Monday the -----

The 25th you are talking about?-- The 29th, the 29th. The Monday readings on - the Friday readings on the 29th that I calculated on the Monday, you know, they were 6 parts, which was still - which was consistent with what occurred on the 22nd.

Yes, but -----?-- Yes.

Let me just put it to you again: the deputies were taking these readings shift by shift for the purpose of the CO make being calculated?-- Yes. If you take the velocity of a roadway you would expect them to calculate the CO make, yes.

They weren't being calculated and they weren't being graphed?-- No, I was not graphing them.

Part of the reason for that was there tended to be this reliance on the Maihak system?-- Yes, yes.

Now, did you yourself have a role in relation to the Maihak system?-- Allan Morieson showed me how to - showed me the workings of the Maihak system, what the system could do and how you could pull recorded values off the graph - off the screen. When he would do his monthly ventilation reports he would also get a print-out of the status of the mine before he

went down, so when he checked his Drager tube readings and his monthly ventilation surveys he could try and calibrate what was actually happening underground to what he would get at his ventilation point, and he also showed me the ability to pull up the graphs, so there was some functions that I was familiar with.

I see. But you didn't have any close association with the running of that system, is that what I take from what you are saying?-- Not a running - not running of the system, being able to look at the system, interrogate it to some degree.

You yourself didn't have any responsibility in relation to training people as to how to use it, or did you?-- No, I was - not training people, no.

Did you see that as a matter of concern as part of the day-to-day operations of the underground mining operation?-- A lot of people were very aware of it. That system has been in place for quite a considerable period of time. A lot of deputies were aware of how to use the system. It was my impression that they were able to use the system.

That was your impression?-- That was my impression, yes.

You didn't see it as your role to ensure that people (1) knew how to use the system and, secondly, that they used it responsibly?-- No, that was not my role to make those decisions.

You didn't yourself make any inquiry as to how the alarm system was set up or how alarms were accepted?-- No, I did not actually.

On a day-to-day basis did you have any association with that?-- No, I have never accepted alarms.

Did you know how to accept an alarm?-- No, I didn't.

Nobody had ever shown you?-- Nobody had ever showed me, and it was a bit of an education, I think, too.

I did put to you before that if the CO make had been calculated from the deputies' readings, then on 1 August it would have shown a CO make of 18.93. Were you ever aware of that?-- No, I was not.

I just want to ask you about some events on 1 August. On that day it seems there was some engineers that came from - was it Capricorn Coal, Cap Coal?-- From Cap Coal, yes.

Three fellows. One was named Glen Everett, the other one Malcolm Waterfall and the other one Martin Adams. Do you remember those three gentlemen?-- I remember the gentlemen, but I'm not sure exactly - I remember their first names. I remember Malcolm.

Malcolm, Glen and Martin?-- Glen, that's right, and Marty, yes.

Now, you took them underground to 512, amongst other places?-- They - I had not realised that they were - I did not realise that they were coming. They are a longwall operation and I don't think any of them had been exposed to any bord and pillar operation, so when they arrived George asked me to look after them, basically discussed sort of some engineering aspects of pillar design and sizes, and really they were there for an education on how to mine using the bord and pillar system and then the partial extraction system which they were interested in.

At some point when you were showing them around you came across a deputy who was with a trainee miner, showing a trainee miner around in 512. Does that ring a bell with you at all?-- Trainee miner, no.

Do you recall speaking to a deputy -----?-- Yes.

----- down in 512?-- It is a custom - well, not a custom - you go down and inform the deputies - I had to ring up - actually ring the deputies up in the section to say that I was bringing down an experienced mine worker - mine engineers to have a look at their system, if they had any problems, and I can't remember who the deputy was, to tell you the honest truth.

Now, while you were down there the deputy either took a reading or had just taken a reading which indicated some 7 or 8 ppm of CO?-- No, that doesn't ring a bell.

Does that come back to your recollection?-- No, it doesn't.

After that reading had been - you had been told of the reading and whilst the three engineers were there with you, you calculated the CO make?-- No, I'm not aware of that, no.

You don't remember that?-- I don't remember that, no.

And in fact the CO make came out to somewhere around either 15 or 17 lpm. Do you remember doing that at all?-- No, I don't remember doing that with any of the engineers, no.

And one of the engineers - one of the Cap Coal engineers made the comment that if they had that sort of reading, that they would be concerned?-- No, that's honestly new to me.

You don't remember any of that?-- No, I don't recall talking about any actual CO makes that we - that were obtained down the pit, no.

Okay. You recall being down there with them and having a conversation, but you don't remember anything more?-- They had not seen bord and pillar operations and they were really interested to see how you would actually set up a bord and pillar operation, where you would locate the boot, where you would locate the shuttle car anchors, how you would physically ventilate it. That was more the line of questioning that I got from them. I did show them and I did photocopy the Part

60 of 512 to give them an indication of what was required by a bord and pillar operation to submit to the Inspectorate, but I don't honestly remember making a - physically making a calculation underground.

Of CO make?-- No, I don't.

15 or 17 lpm?-- No, I don't. I didn't and I don't know - when you go underground you - and I had said to them - I had explained as much as I could on the surface to them. I said to them when they go underground to talk to operators and deputies when they were down there, and I introduced them to a number of operators and deputies. That's the way I conduct myself underground because those are the fellas at the face all the time and they would - they might have discussed that with one of the deputies, I'm not sure.

But you don't remember yourself calculating a CO make of either 15 or 17?-- No, I do not, no.

If you had calculated a CO make of 15, would that have stood out in your mind?-- Well, that morning we calculated - that was the -----

1 August?-- ----- 1 August. That morning I calculated the CO make to the 14.27.

14.27?-- That's correct, yes.

That's 1 August?-- That was - no, that was the Friday reading that was given - I beg your pardon, sorry.

13.57?-- The 13.57, I had calculated that figure on the Monday morning.

What I was asking you is if it had calculated out to 15, would that have caused you to be concerned?-- I would have asked the question what was maybe happening and maybe -----

In any event, you don't remember -----?-- No, I don't.

----- any of these engineers saying that if they had that reading, they would be concerned?-- No, I don't, no.

There was a comprehensive investigation carried out by the mine after the explosion; is that right? You have referred to the incident team?-- That is correct, yes.

Were you part of that?-- No, I was not.

Did you see material that was produced as a result of that?-- Sorry, the incident team was - there were a lot of people there. The collation of data was another aspect of what happened after we had sealed the portals.

I am just wondering to what extent you were party to what was produced and -----?-- Albert would come up to me -----

----- investigations that were made?-- ----- on a daily

basis and ask me to collate a list of information and I would collect whatever information I had to give to him and he would then submit it to the Mines Department.

Was material produced in the course of that investigation shown to you, first of all, as the mining engineer there and, secondly, as a person who was jointly represented with the mine here at the hearing?-- There were a lot of things that I collated. There were some things that most probably I wouldn't have seen and there are a lot of things that I actually put together, so -----

I see. Anyway, you were generally aware at least as to what was being done?-- That's correct, yes.

Because, in effect, you were going to be jointly represented here with the mine, or at least at some point that decision was made; is that correct?-- That's correct.

And you would have been interested in the sorts of material that was coming out - kind of material that was coming out of the investigation; is that right?-- I was interested to know what had happened, yes.

Now, there were also some reports of independent investigators obtained. When I say "independent", people outside of the mine itself and outside of BHP Australia Coal?-- That is correct, yes.

Have you seen those reports?-- No, I haven't seen those reports.

You haven't seen those reports?-- No. Sorry, there are some reports that I would have read, you know, during the Inquiry but not at that particular - not while we were - not before proceedings occurred, you know.

Well, I am talking about right up till now. Have you seen the reports that have been produced?-- I have seen some reports. I have read - I have tried not to read too much extra information to try to discern from what I did know at that point to what I do know now. It's a very hard task.

You didn't want to confuse yourself?-- No, it's hard enough as it is.

But no doubt you were interested in -----?-- I was very interested, yes.

----- the reports that were coming out as to what might have been indicated as to the cause of the explosion?-- Yes, that's correct.

Now, there is just one document that I will ask you to have a look at, if you would. It's a report that's been produced. If you can just have a look at that, and I will also provide copies for the panel and for the parties. Now, if you go to the last page of the actual report, not the annexures, you will see that that's a document dated 1 February 1995, the

last - it's actually page 48. Go back past the annexures to the last page of the report?-- Yes, yes.

And signed by Mr Bill Highton, H-I-G-H-T-O-N; you see that?-- Yes, I do.

Now, that's a document that was provided to my instructing solicitor under cover of a letter dated the next day, 2 February 1995, just to make that clear. Now, have you seen that document before?-- I was given this document this month - was it last month - this month.

Well, it's dated this month?-- Yes, it's dated 1 February, but I honestly have not read it, no. I have got it in my room but I haven't read it.

I just want to take you on a short walk through the document, in effect, so that I might just ask you some questions about that. On the first page of the document you will see that Mr Highton about one-third of the way down the page mentions the configuration of the main roadways in 512?-- Yes.

And he says that they were slightly offset so that a smooth ventilation flow would not occur in these roadways. He goes on to say, "The result of this effect was a slight increase in the ventilation pressure over some of the pillars. In addition, some of the worked pillars were reduced to such a size that fracturing would become unavoidable, leading to leakage paths in the already crushed coal." He says, "The fracturing of the pillars would be sufficient to allow air penetration but probably insufficient to create stability problem." Now, just pausing there a moment. Was this a matter which, in terms of design of the panel, caused you any concern? Either in design of the panel or in terms of the extraction process was that a matter that caused you any concern?-- The take a row, leave a row system of operation left a five metre fender which is basically, therefore, like an indication stook in that type of mining system. It was - I understand from Bernard Madden's calculations in his design that that fender was never ever expected to - never expected to carry any load, but he was very surprised when he did visit the underground and inspected the goaf to see that the five metre fenders stood up quite - the stooks stood up quite admirably, and that's quite evident in the report that he has tabled and the photos that he submitted.

When you say they stood up, did they remain standing?-- They, did yes.

What about the fracturing?-- I can't comment on whether it was fractured all the way through.

Was that a matter that was addressed in terms either of the plan or in terms of the amount of the pillar that remained?-- It was determined that the 5 metres was a good size fender to leave. Because we weren't leaving any props in the goaf, that fender would give the operators a good indication that if there was weight coming on in the general localised area that they were working, it would be a good indication for them to pull themselves out. That's the reason why the 5 metre-----

The fender started to collapse, you mean?-- That's correct. The fender would give you the first indication of it - the indication would be on the fender, anyway.

I'm not sure that answers my question. Was this question of the fender fracturing, so as to allow air, in effect, into the fracture in the fender - was that a question that was addressed either in the design of the panel or in light of the amount that had been taken off the fender in the actual extraction - whether they had been reduced further than the design had intended?-- The design ultimately - the better scenario would be to take all the coal, but because we weren't putting props in there, that is a better mining - a safer mining system, and those fenders weren't ever expected to stand up as a goaf progressed.

What you are saying really-----?-- So, they were going to fracture, yes.

Fracturing was expected?-- It was expected, yes.

That's all we need to know. You see towards the end of that paragraph that Mr Highton says - about two-thirds down the page: "However, in practice, what would occur is that a pressure drop, albeit small, would exist over the fractured coals at the junction intersections."?-- Where are you, sorry?

Two-thirds down the page, six lines up from that same paragraph we were looking at. "However, in practice, what would occur is that a pressure drop, albeit small, would exist over the fractured coals at the junction intersections. It has been shown in certain seams that a pressure drop as low as two pascals acting on a fractured pillar can lead to a spontaneous incident." Was that a matter that was ever discussed in terms of design, combining size of pillars and any pressure drop created in the ventilation system by the offset pillars?-- No, it wasn't.

Can you go over the page? There is a section there that's headed, "Indications of Spontaneous Combustion Activity". Mr Highton there says, "Carbon monoxide is the most sensitive indicator of the initial stages of the oxidation of coal, so, the inference must be drawn, that continuous monitoring of

carbon monoxide is the best means for early detection of spontaneous combustion." Now, that's something that I gather, from what you have said in evidence, is what you would subscribe to?-- Yes.

Towards the bottom of that page, the last paragraph, he goes on to say: "Experience in Europe has shown that very small active heatings can occur in areas of workings yet the resultant level of carbon monoxide in the mining roadways does not significantly increase." Now, was that a feature that you'd ever adverted to yourself - that is, that you could have an area where carbon monoxide was gathering around a small active heating but without that carbon monoxide being reflected in the readings taken in the roadways?-- No, I wasn't. I was not aware of that, no.

I gather from what you have said so far in evidence that you have always relied on the fact that what you get in the roadways is a reflection of the carbon monoxide levels throughout the goaf?-- I think - yeah, it is a very simplistic way of saying it, yes, unless you went to actual cut-throughs and were able to determine a source from a little bit more of a specific location. That's why you walk - you walk down the - down a heading if you were doing some type of examination.

And that's why if you were put on alert by some higher CO make, or higher parts per million reading, you would go down right along the back, as you agreed yesterday, and you would carry out as thorough an investigation as possible; is that right?-- You would do, yes.

The good sense in that is illustrated by what Mr Highton says over the top of the next page, where he says, "For instance, in one colliery in the UK, in a district air quantity of 15 cubic metres per second, the general body carbon monoxide content only rose 2 ppm yet a sample pipe into an unventilated area showed a carbon monoxide content of 4,800 ppm and hydrogen of 2,000 ppm. A small but rather warm heating. So, whilst accepting that carbon monoxide is probably the best means of early detection, one must be circumspect when interpreting samples in a moderate to large air flow." First of all, do you agree with that statement - that conclusion there - that is, one must be circumspect?-- Yes, obviously, with an incident like that, yes.

Again, that reinforces the need for thorough investigation whenever anything happens that puts you on alert as to the possibility of a heating in the goaf?-- That is correct, yes.

In fact, the example given there is a pretty frightening one; isn't that right?-- Extremely.

And again, that heightens the difficulties that arise if you have got some area of the goaf that's not being properly ventilated; isn't that so?-- That's correct, yes.

Which was precisely the situation around about 17 June in 512 panel?-- In June, yes.

Can I take you over to the next page, page 4, where in the second paragraph Mr Highton says: "It has been said that the method of working in 512, including working the loose bottoms, was different from other districts, thus leading to a higher CO background figure." Now, just pausing there, that's what you have been saying in evidence here; isn't that right?-- That is correct, yes.

It goes on to say: "Whilst it is very true that methods of working can influence the CO levels of a district (allowing for the ventilation fluctuation), I do not believe it greatly affected the normal background levels of 512. This is purely my opinion when considered in light of a long experience on the subject and also when I viewed the plan showing how other districts at Moura were worked with pillars of a not dissimilar size." Now, what's your comment on that? Obviously Mr Highton doesn't put the same weight on this suggestion of the manner of working that you and other people at Moura did?-- That's right. That is his opinion. I mean, I am not here to question his opinion, am I?

Well, that's clearly an area where it diverges from yours, at least; is that right?-- Well, yeah, an opinion, yes - that is my opinion, yes.

You will see that in the next paragraph Mr Highton there points out that "more than one method of detection should be used" in trying to ascertain whether there is a spontaneous combustion problem, and he describes what he calls "the early warning systems" as being: "(1) The actual CO percentage in the sample. (2) The actual make of CO at the sampling point. (3) The CO/O2 deficiency ratio.", with the qualification on that that local experience of the values has to be established; is that right?-- That is correct, yes.

And fourthly the physical signs, such as smell - that's gob stink - haze and condensation. Now, three of those, at least, are the sorts of things that you look to; is that right?-- I did not personally look at the CO/O2 deficiency ratio, but those - all those - those first three are what happened at Moura, yes.

I was going to suggest that the three you might have looked to were numbers 1, 2 and 4?-- That's right.

Except there were never any reports-----?-- There were never any reports.

-----of smell or condensation?-- That's correct.

But the third one, the Graham's Ratio, CO/O2 deficiency ratio was one you didn't really know about?-- That I didn't personally, no.

And yet that's really a very useful early indicator, isn't it?-- My subsequent readings have indicated that, yes.

Mr Highton does go on to examine the relevant aspects of the

evidence, but I don't want to dawdle on those. I would like to bring you through to page 7, where, after setting all of those matters out - and we have mentioned plenty of those even in the course of your evidence so far - not all of them - if you come to page 7, half-way down the page, what Mr Highton says is this: "So, if we consider these statements, physical findings and samples from 512 district from early July to the sealing off on Sunday the 7th August at approximately 01.15, what can be deduced? First, if we view the increases in the CO/O2 ratios, figures in July were shown (Colliery readings) to rise to 0.12 per cent on the 25th. This value, in my opinion, is lower than the figures I would expect to see in the UK mines, where spontaneous combustion is a known problem, but irrespective of the actual level of the figure, the rise should be viewed with concern and the experienced mining engineer would check the district thoroughly to ascertain why the rise had taken place. Any subsequent action would depend on the findings of the district inspection. The inspection would attempt to locate the possible heating area. Once established, a detailed CO sampling survey would be undertaken with samples taken from the goafs on the return side of any possible migration paths. Again, this is where the experienced mining engineer would have the knowledge of where to sample. By this technique, the suspect heating might be located and pinpointed to a suspect migration zone. Again, I repeat the need for work to be carried out on this subject for the Australian coals." That's on the CO/O2 ratios. Now, can I suggest to you that, first of all, there was a difficulty that at least in respect of the significance of CO/O2 ratios, you had the disability of not being experienced in that regard; is that right?-- That is correct, yes.

But did anybody at any time discuss with you that there might be a need to look at this question of the Graham's Ratio and to keep an eye on it because there was this concern growing about 512?-- No, I can't say there was.

Nobody at all? Not a deputy, an undermanager, a manager or anybody else?-- No.

Of course, what Mr Highton says there about what would be done, once there was some concern, is correct, isn't it - that you go into the section and you take steps to isolate the area where the CO might be being produced?-- That's correct, yes.

I mean, really, that's the sort of process that I suggested to you yesterday should have been carried out in light of the 8 ppm reading first of all, and I think you agreed that that was right?-- Yes, but the-----

And a thorough investigation should have been carried out at that time?-- But with the facts that we knew at the time - the facts that I knew at the time, I assumed that it would be an incorrect reading at that particular instance, but, yes, if you were going to carry out a full investigation, yes.

Can I take you then over the page? The first part that Mr Highton looks at is the deduction. Over the page, to page 8, the second paragraph there, this is the second

deduction - that is: "Assuming the lower alarm level was at 5, the actual parts per million CO in the 512 return exceeded that level from late June. By the week of the sealing (7th August 1994) the CO level was quoted as being between 7 and 10 ppm. If one compares this with the CO levels for districts which were said to have been sealedexceeded that level from late June. By the week of the sealing (7th August 1994) the CO level was quoted as being between 7 and 10 ppm. If one compares this with the CO levels for districts which were said to have been sealed ace to 4 ppm, 511 trace to 5 ppm. If we now view the records for 5 North, the district said to have been sealed because of a heating, then these show:- 5 ppm to 8 ppm, with a figure of 7 ppm the day before the sealing. (These figures are of course viewed in conjunction with the CO make to ensure quantity fluctuations do not muddy the issue)." Now, I think we touched on this yesterday: that, in fact, what you saw, even at the time in 512, was a considerably higher production in terms of parts per million of CO than existed in the other panels; is that right?-- On the Monday, that was - the seven days before - six days before sealing it was still running at 6 parts. It was - I mean, on the 29th, it was running at 6 parts, yes, but towards the end of the panel there was a different scenario, yes.

That's right, but still significantly before the actual sealing or the rise that we saw immediately before the sealing?-- The rise before - on the weekend of the sealing, yes.

In fact, there had been readings of 7 ppm during that week?-- That is correct, there was, yes.

Okay. Now, it goes on to deal with the third factor; that the - at the bottom of that page. It says: "The third factor is to consider the CO production in litres per minute for 512 district when compared with other districts at the mine. From a date in June (10th) 1994, with one exception, the CO production in 512 had exceeded 10 litres/minute and from the 16th June, the CO production showed a trend upward until on Friday 5th/Saturday 6th, figures of between 18 and 21 litres/minute were calculated. If we now look at the CO volumes for 401/402, 403 and 501:- 401/402, 2 to 11 litres/minute. 403, 2 to 5 litres/minute. 511, 2 to 9 litres/minute." Over the page: "The graph for 5 North (known heating) shows it rising to a figure of approximately 20 litres/minute some 20 weeks before sealing it, then dropping below this figure to a volume of 14.14 litres/minute approximately 1 month before sealing. It again began to increase rapidly on the day of sealing. A comparison of these figures on the graph (Figure 3) shows 401/402, 403 and 511 to have a much lower rate of CO production. It has been said that different mining methods as practised in 512 may have accounted for greater background levels of CO. Again, it is an opinion, but after studying the layout plans for the mine and with over 25 years of hands-on experience then I do not subscribe to this theory. 5 North, which appeared to have a greater area of coal exposure, levelled some 20 weeks before sealing at a higher figure than 512, but 512 showed an upward

trend for some 6 to 8 weeks before it was sealed. Both 5 North and 512 appeared to have an accelerating rate of CO production shortly before they were sealed." Now, first of all, all those graphs, etc, are items that you have already looked at, aren't they - the comparative graphs?-- Comparative graphs, yes.

That's right. The point that is of significance for Mr Highton was this upward trend that continued over some six to eight weeks before the sealing?-- That's right.

And then the sharp increase at the end. Now, your view is that the upward trend is consistent with the extraction and the loose coal?-- Yes.

Is that stating it fairly simply?-- That's right.

But, in fact, Mr Highton expresses the view that any upward trend in a sense is something that might be of concern - might be an indicator?-- That is his opinion from the draft, yes.

Again you didn't do any research or take any steps to find out the views of people who had had a lot of experience with these sorts of situations?-- No, I hadn't, no.

And in any event, towards the end of that week when the more rapidly accelerating rate of CO production was occurring on the Saturday you weren't aware of it?-- I was not aware of it, no.

The fourth factor is set out in the next paragraph: "The fourth factor to consider is the physical signs such as smell and haze. Both these were reported by personnel in the months of June (smell) and August (haze and smell) with the majority of the reports being in the immediate days before the final sealing. If one looks at Figure 1, then the presence of smell, benzene and tar smells reported (also called gob stink), indicates that the temperature of the coal was certainly increasing beyond its normal level." Do you see that there?-- Yes.

Now, you had the disadvantage in terms of coming at it with whatever experience you had had at that point, that you were never told of these things in 512, that's the smell in June and these later reportings of a haze and a smell?-- No.

Never told of that?-- I was not told, no.

And then Mr Highton goes on to analyse those indications available in 512. He refers first of all to the increases in the CO/O2 ratio values in 512. Secondly, to the increases in CO ppm to a figure of 10 with figures between 7 and 10 recorded in the week before the sealing. Thirdly, to the total CO production in litres per minute being in excess of a figure of 10 in a period of at least six weeks before the sealing with a figure on the day of sealing in excess of 20 litres per minute, and in conjunction with that he goes on to say in the paragraph at the middle of the page: "My own opinion, based on 35 years experience in the industry, is that one should very carefully watch for changes in the rates of CO production and if the trend is continually upwards then one should carry out a thorough investigation to ascertain the reasons for this and depending upon what is found, a case of preventative controlling action should be taken." Just pausing there, that's what we were dealing with a moment ago, that he said, really any upward trend ought to be investigated?-- That is correct, yes.

Which was a different approach to that which was taken by you and other people at the mine; is that right?-- That's correct, yes.

And then fourthly he says in respect of 512: "Reports of benzene and tar smells in and the presence of a haze/shimmy were made.", and he goes on to say, in his opinion any reports of benzene/tar smells in a mine district should be thoroughly investigated, and as far as that opinion goes, first of all you weren't aware of those reports anyway?-- That's correct, yes.

Let me ask you this: if you had been, as a mining engineer, what would have been your view? Any reports of a benzene/tar smell should be thoroughly investigated?-- Should be thoroughly investigated, yes. I would just like to make a comment on that. On the 22nd when I went down with Dave Kerr I did ask him on that particular evening while we were walking down if I was supposed to be smelling anything. That's a question I asked.

Right?-- And that - I had not smelled a tarry smell or anything like that before, and I really wanted to - and because Dave was a very experienced person in the industry I was grateful first of all that he came up, and I said that to him as we got out of the Rover at the end as we got to the surface, and also to find out if there was anything that I had to smell and he at that point said there was nothing there at all. He couldn't smell anything himself.

Well, that just reinforces your view that a smell would be significant?-- That's correct, yes.

And if you had been given the details of people smelling a tarry smell or a benzene smell you would have made sure a thorough investigation was carried out; is that right?-- Yes, I would have, yes.

Can Your Worship give me just five minutes more before the morning break?

WARDEN: How much more of this report are you going to go through?

MR CLAIR: Not much. I would expect to be finished in five minutes.

WARDEN: Righto. Thank you.

MR CLAIR: Mr Highton then goes on to consider the results from the Unor point 5, that's the one behind the seals after sealing. I don't want to take you through that in detail, but I just draw your attention to what he says at the bottom of page 12. Now, I appreciate that you weren't there at this time and you really weren't in a position -----?-- Sorry, which page are you on?

I'm looking at the bottom of page 12. On page 11 he begins to consider the results from point 5 after sealing, you see? I'm not going to take you through that, as I say, in any detail, but I'm drawing your attention to the bottom of page 12. Before I read that part there I just want to make the observation that you weren't there after sealing?-- No, I was not.

So you didn't really have any opportunity to put into effect any views that you might have had about what was being shown by the readings; is that right?-- That is correct, yes.

But nevertheless I want to get your comment on those. Mr Highton sets out the various increases and at the bottom of

page 12 he says: "The further increase in CO percentage which is shown in what is set out there was, in my opinion, an indication of some spontaneous activity." It goes over the page and he says: "At 22.10 hours sampling time (22.55 surface analysing time..." - pausing a moment, that's substantially before the time of the explosion; is that right?-- Yes, I assume so, yes.

"... the Unor results showed CO 154.5 ppm; CH4 10.65 per cent; CO2 .12 per cent; O2 18.35 per cent; Ratio 3.73." He says that a change of scale could have affected the CH4 reading and the actual reading could have been between the previous reading of 4.99 and the recorded figure of 10.65, and I think graphs have been adjusted to reflect that. He goes on to say: "Irrespective of what may now be considered in hindsight, in hindsight vis a vis the accuracy of the methane content and the CO/O2 ratio, it must be said that on the evening of Sunday, 7 August, the sample was available at the surface at 22.55 hours, some 35 minutes or so before the explosion. The purpose of the monitoring system is to forewarn the experienced operator of a possible developing dangerous situation." If you had been there and if you had been aware of this very substantial increase in CO that had taken place up to that time of five to 11 what would have been your view? Would you have appreciated what you were seeing at that time?-- At that point I don't think I would, no, only from the lack of my experience with mine gases.

He goes on to consider further these readings from various points - or further from point 5 and at the bottom of page 14 he says: "So what could be deduced from the Unor analysis results from point 5 after the sealing up to the real time sample of 22.10 (surface time 22.55)." And on the next page he says: "If we compare the results with those from a district (401/402, 4 South B) which was said to have been sealed under non-duress conditions - I take that to mean that the district was not suspected of having a heating when sealed.", and he goes on to set out the figures, and the last paragraph on that page, page 15, he says: "So if we first look at the levels of CO in parts per million it took approximately seven days for the CO in 401/402 to reach a figure of approaching 150 ppm. In 512 it took approximately 20 hours, a rate of increase over eight times greater. In my opinion an indication of spontaneous activity." Now, again can I ask you this: if you had been there and made those calculations would you have been in a position to form a conclusion on that?-- No, looking at 401/402 post sealing - I mean I had not analysed what the CO rises were, so I wouldn't have been able to make that -----

Do you think that it would be wise to first of all ensure that at the time of a sealing that particular - particularly where there is a concern about spontaneous combustion in a sealed panel, that there be somebody there who first of all is familiar with comparative situations, and secondly who is in a position to make some judgment about what ought to be done?-- Yes, I do. It's obvious.

Do you agree really this wasn't done in this situation?--

Well, there was quite a lot of experienced people that had been at the mine for quite a considerable period of time that had experienced 5 North, experienced 401/402 panel, but I don't know if anyone analysed it to the extent that Mr Highton has analysed it and put that down in any format.

The actual analysis can be done fairly quickly if one knows what to do ;isn't that so?-- If one knows where the information is, yes.

It's not a complicated or particularly complex matter to carry out these comparisons?-- No, it is not, no.

Mr Highton then goes on to review the monitoring data after the explosion, I don't propose to take you through that. I want to take you to the conclusions at page 44, and these to some extent reflect what was there earlier. Half-way down page 44 his first conclusion is in respect of the CO/O2 ratio and what he says later in that paragraph, that it is trends in the ratio that should be investigated, that is, show signs of increase it should be investigated. We have canvassed that. The second conclusion at the bottom of the page, "The CO level in 512 return exceeded what was said to be the initial alarm level at 5 ppm from the end of June 1994." He later says, "When compared with the upper levels of between four and six for 401, 402, 403 and 511 districts, the 10 ppm can be said to be high." Over the page at line 2 he says, "All this must be viewed in the context that a heating can produce as little as 1 ppm in an air quantity of some 20 cubic metres per second." The third conclusion which is at the second paragraph on that page says, "With the exception of 5 North districts, the levels of CO produced in litres per minute (CO related to air quantity) for 512 was higher than that of other districts checked." In his next paragraph he makes his fourth conclusion that the presence of both smells and haze in the 512 district were information indicative of a heating. He says, "When the smell is described as having a benzene or tar smell then the rate of oxidation is increasing." Finally his fifth conclusion there is that from the samples taken by the tube bundle system he says that the CO/02 ratio quickly began to increase until some 20 hours after the sealing, a figure of .82 was calculated. Do you see that? Over the page he says, "The CO readings in parts per million then rose to a figure of 154 parts some 21 hours after sealing." He said, "This is a rapid increase when compared with readings obtained from other districts with the exception of 5 North." All of those conclusions are set out there. Were you made aware of the conclusions that were reached by Mr Highton after this report was received? I know you said a copy was handed to you, but you didn't read it in detail?-- I haven't -----

Were you made aware of that?-- I've been made aware in the most general sense of those - of Mr Highton's opinions, but I hadn't actually read his report.

At the time that the report was delivered undercover of the letter 2 February my instructing solicitor was also informed that BHP Australia Coal does not intend to either call Mr Highton or to tender his report. Now, you are jointly

represented here. Were you consulted about that at all, as to whether Mr Highton should be called?-- No, I was not consulted.

Or as to whether his report should be tendered?-- Not on the decision whether it should be tendered or not, no.

Your Worship, I do tender that report.

WARDEN: Admitted and marked Exhibit 156.

ADMITTED AND MARKED "EXHIBIT 156"

MR CLAIR: I have no further questions of Mr Abrahamse, Your Worship.

WARDEN: Thank you. This might be a convenient time to have the morning adjournment.

THE COURT ADJOURNED AT 11.15 A.M.

THE COURT RESUMED AT 11.35 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR CLAIR: Your Worship, just before Mr Morrison starts, I want to clear up one matter - it may not have come through as clearly as I myself thought it did - as to the source of that last exhibit, but to make it plain, that report was provided to my instructing solicitor under cover of a letter dated 2 February from Mr Morrison's instructing solicitors, and the report, as I have mentioned, is dated 1 February. The letter contains a lot of other irrelevant information, and for that reason I didn't tender the letter, but I will read the relevant part of the letter into the record. It reads this way:

> "We have recently been provided with a further report not the product of the internal inquiry which is to the same effect. A copy of this report by Mr Highton, a UK based consultant who earlier participated in the internal inquiry, is enclosed. It is provided to you for whatever informative or other assistance counsel assisting the Inquiry may make of it. As is apparent from the report, the conclusions of Mr Highton correspond in all significant respects with those of SIMTARS and Dr Van Dolah. BHP Australia Coal intends calling the latter to give evidence at the Inquiry. In these circumstances, BHP Australia Coal does not intend to either call Mr Highton or tender his report which is provided to you on the basis noted above."

Just to put it in context, the reference to the internal inquiry in that paragraph resulted from the fact that my instructing solicitor had written to Mr Morrison's instructing solicitors asking about whether an internal investigation was carried out and asking for the results of that internal investigation to be provided. Thank you, Your Worship.

WARDEN: Thank you. Mr Morrison?

MR MORRISON: Thank you, Your Worship.

CROSS-EXAMINATION:

MR MORRISON: Mr Abrahamse, can I take you back a bit to cover some aspects of your history, if I may? You mentioned that you had graduated from Wollongong University in 1987 in Mining Engineering?-- That is correct, yes.

In which year did you commence that course?-- I started in

1992 - '82, sorry.

And the course was part full-time, part part-time as you performed it?-- That is correct, three years full-time study and then the remaining three years I did part-time.

I assume that it is possible to do it full-time?-- Yes, it is.

But you didn't opt for that?-- No, I opted to try and get into the industry to get a - while I was at Lithgow the opportunity came to pass where I was able to join the Miners' Union.

That's the UMW?-- I can't remember which actual union it was at that stage of the game, but I was classified as a Federation worker, federated machine man worker, and by being able to join the union it gave me a chance to get experience at the face so that at a latter stage I would be able to sit for my respective undermanager's and manager's certificates.

In the way you approached the course, did you do part of it full-time and then part of it part-time, and how many years full-time and how many part-time?-- As I said before, I did three years full-time for the first three years of my course. The remaining year, the fourth year of the Bachelor of Engineering Degree, was completed over a three year period. The last year consisted of a number of subjects and the completion of a thesis. The thesis I had to postpone in my second year of working at Invincible because of lack of information that I was able to obtain to complete that specific topic because we were retrenched - we were going to be retrenched at the end of that year, but we were reinstated and I obtained that information early in my third year as a part-time student and completed my thesis in that year by itself.

You told us the thesis was on strata control longwall gateroads. By its name it suggests Invincible was a longwall mine?-- That is correct, yes.

Was your thesis in fact a case study of that colliery?-- That is correct, yes.

There was no bord and pillar at Lithgow while you were there; is that right?-- There was no bord and pillar extraction there. There is a bord and pillar system for mining your main heading systems, and as a greeny, so to speak, that's where they placed you, in the development sections of those - of a five heading system.

So, you in fact worked on a bord and pillar system, albeit development?-- On development, yes, first workings.

What job were you performing?-- I was a machine man. I was a continuous miner operator and a shuttle car operator.

And as much in one category as the other?-- I started off on the shuttle car and then as you progressively gained

experience and respect underground they then grabbed you and threw you on the miner and taught you how to control the miner.

Did you continue in that sort of work for the full three years that you were at Invincible?-- That is correct, yes.

In terms of the size of Invincible in tonnage production, how did it compare with, say, No 2 at Moura?-- I think Invincible was planned at a 2 million tonne per annum operation.

And No 2?-- 700,000 tonne.

A significantly smaller operation?-- Significantly smaller, that's correct, yes.

At Invincible I think you mentioned that you weren't involved in the engineering side of the mine?-- No, I wasn't involved as part of the engineering team, no, but I did assist - it worked quite well. I assisted the mining engineer. As a Federation worker I was then able to use drilling equipment to install monitoring equipment, and we worked together in that regard, I as an operator and he as an installer of monitoring equipment, and then subsequently I helped him take readings and calculate some - assist him in collating some of that information.

Can I just ask you this: in terms of getting face experience, is that necessary to your qualification as a mining engineer or your entitlement to practice as a mining engineer, or is that necessary to the tickets that you referred, undermanager's and manager's tickets?-- No, you can obtain your degree by having work experience during your Christmas vacation and that qualifies you to obtain your mining engineering degree.

And to practice as a mining engineer?-- And to practice as a mining engineer, that's correct, yes. The three years - the face experience is part of the requirements by the board of examiners to sit for your second class and first class ticket.

What you say then: you could have mining engineers entitled to practice as such with a lot less experience than you?-- That is correct, yes.

And the requirements of the syllabus, so far as you knew, didn't require anything like the experience you got?-- Sorry?

The requirements of the course you did at the university didn't require you to have anything like the length of experience you did get?-- No, no, it was my choice.

Now, you mentioned that you did a subject during your degree called "Mine Gases". Who taught that?-- Professor Hargreaves.

Is that Alan Hargreaves?-- Alan Hargreaves, that's correct.

Was that just one module within a subject otherwise, or was that like a whole year subject in itself?-- No, that was - we had two semesters. In one of those semesters, mine gases, I think, was for approximately six weeks, if I recall correctly.

But within that subject I think you said you didn't do CO make as part of that?-- Not that I can recall, no.

And what about spontaneous combustion as part of that course that Professor Hargreaves did?-- I honestly can't - I can't recall if it was, but - I'm not sure.

Clearly not much emphasis if it was addressed?-- I'm not sure.

Now, you also did some vacation work at Newvale that you referred to?-- That's correct, yes.

Over the Christmas break, I think you said?-- Over the Christmas break, prior to me starting at Invincible, yes.

That was a mine in the Newcastle area?-- That is correct, yes.

Where spontaneous combustion was a question?-- That is correct.

And while you were at the mine, what were you taught in relation to dealing with spontaneous combustion?-- At the time I was at Newvale I was put into a crew once again for the 12 weeks that I was there-----

Sorry, can I ask you to pause? You mean you were working at the face again?-- I was working at the face again, that's correct.

As an operator?-- No, I was not allowed to operate any machinery, but I did on occasions just hang on the end of a bolter, but generally assisted the crew. I was classified as a supernumerary in the section.

You were put in a crew?-- That is correct.

I was asking about what you were taught about how to deal with spontaneous combustion?-- The issue of spontaneous combustion only rose during our induction period with the ELCOM group. During the Christmas vacation there were quite a number of vacation students that came from all over Sydney and Newcastle. A group of us went through the induction together and were placed at - then placed at different pits. During that induction, the issue of spontaneous combustion was raised, and then, like I said before, Pommer just basically gave us an idea of what he had encountered in his district for

a number of years.

And did Newvale Colliery hand out to inductees literature or books like the red and blue book, or anything else like that on spon com?-- No, I didn't see a red or blue book down there.

That induction down there was just verbal with no back-up in terms of its dealing with spon com?-- I never received a red or blue book as such. I don't know - they did hand some literature out. I can't remember exactly what was in the literature - in the sense of what was going to be conducted over that day.

But not in relation to any particular item?-- No, no.

Eventually you were retrenched from Invincible and you mentioned you went to work at Bondi Sewerage doing the tunnelling?-- That's correct.

The outfall tunnels?-- Yes.

What job were you doing on that?-- At that stage I was a machine operator once again. They were looking for people that could operate an Alpine miner that they were going to introduce into the tunnel drifts. When I started, they utilised just a drill and blast technique, which I had not used, and I subsequently became experienced in, and when the Alpine came, I had a number of shifts on the machine itself.

So, albeit not a coal mine, working at the face of this tunnel?-- That is correct, yes.

And that was only about six-odd months?-- That is correct, yes.

And was that the end of that project, or did you leave at all?-- No, they were - there was talk again of retrenching people from that particular project. I basically jumped ship for a better offer from my brother-in-law.

And then you ran some family businesses for a while?-- That is correct.

And in 1991 you decided to go back to mining so you could use your degree?-- That is correct, yes.

And you mentioned that you came to BHP on the graduate program, which was, as its name suggests, a scheme where graduates are taken and rotated through the operations?-- Through two operations, yes, that's correct.

As you understood it, was that two diverse operations? I think you suggested it was open-cut or underground, or could it be two operations within underground, for instance?-- I think the scheme extends itself now to two undergrounds, but at the time that I started, if you wanted to go to the underground operation at Moura and you were fresh out of university, you had - you effectively put an extra year on

your graduate training scheme so that you could get two full years at an open-cut and one practical year at the face at Moura No 2 underground.

So, face experience mattered to how quickly you could go through the graduate program?-- Sorry?

Experience at the face - one's length of time or length of experience at the face was a matter that impacted on how quickly you would complete the graduate program?-- No. When people came out of university, they obviously would not have had any practical experience in underground operations. The 12 months practical experience as part of the graduate program was there for people in that circumstance, but because I had already had a significant number of years of face experience, I requested to go into the planning side of the underground operation.

Well, your first job was Norwich Park, which was open-cut?-- That is correct, yes.

What were you doing there?-- I was - my position at that time was the drill and blast engineer for the open-cut.

Tell me what you would do - what your duties would include in order to perform that task?-- I was responsible for the designing of overburden shots, scheduling of drill patterns and drill design, and we looked at different techniques for bank shooting, or overburden shooting, and also while I was there I was given a number of projects that were significant to that particular operation. I was basically in the engineering department looking at different projects and then specific duties as a drill and blast engineer.

And did you perform some relief duties as drill and blast foreman as well?-- That is correct.

Actually doing the work?-- Yes, during my time there when - if there was a specific - a dedicated drill and blast foreman, when he went on holidays, because I was close enough to the operation with regards doing drill and blast, I was asked to go out in the field for those three to four weeks.

At the end of your period at Norwich Park, you went to Moura No 2?-- That is correct.

Did you request the move back underground?-- Yes, it was on my - at my request that I go back underground, yes.

And because you had done those years at the face, you were, by choice, or by direction, headed towards the planning side?-- Yes.

Was it choice or was it direction?-- It was choice. I had requested that, yes.

Now, when you came to No 2, there were a number of personnel there who were still there when this incident occurred?-- That is correct.

And some who had since left?-- That is correct.

Mr Reed was the manager?-- That is correct.

Mr Mason the undermanager in charge?-- Correct.

The three undermanagers were the ones that we have heard mentioned again, McCamley, Squires and Atkinson?-- That is correct.

There was a relief manager, Mr Danvers?-- Yes.

He is one who has left?-- Yes, he was gone to Capricorn.

Did he perform some other role as well? Was he a training officer?-- He was an undermanager/training officer, yes.

Mr Sims wasn't there at that stage, I think?-- No, he was not.

He is another undermanager that's been mentioned?-- He was a night shift undermanager.

Sorry?-- The night shift undermanager.

Mr Barraclough was there?-- Not when I arrived, no.

He came subsequently?-- He came subsequently after me.

At the time of this incident, he was the safety and training officer?-- That is correct.

And performed also a role for a time as acting manager?-- That is correct.

And Carl Pritchard was there, the engineer?-- He was the open-cut/underground engineer, yes.

Mr Pritchard is the chap you were referring to yesterday as - that you saw from time to time. He was centred at the open-cut?-- Yes, in the engineering section of the open-cut, yes.

And he had to cover both open-cut and underground?-- That is correct, yes.

And once you arrived at the open-cut, how much time did you spend doing, as it were, Mr Pritchard's work?-- I was dedicated to the underground 100 per cent, so I really took - whatever he had put into place, I then tried to adopt and maintain.

You didn't see it as your role to overturn the existing systems?-- No, it wasn't. No, I was only - at that stage I was still there as a graduate engineer.

With no promise of a-----?-- No promise of a position at the underground after that year's stint, yes.

So, for that period at least until you were appointed full-time engineer, you were dealing with a system, if I could use that word, for the overall operation at the mine - a system that other people had laid down and operated?-- Yes.

Was any element of that changed by you during that time?-- There was a - yes, there was. The - in the sense of - in a simple sense of having plans available and put up on the walls and - for identification in the room that was - that we - that we lived in in the end of the block, those type of systems. I looked for more accountable monthly planning and reportable systems.

Just explain that to me a little bit more, please?-- At the end of every month there was a monthly report on production status and some scheduling for the next two months, three months. I then broadened that task while I was at the underground to try - also schedule outbye jobs that were required to be put in place before we could go to different areas. The methane drainage was another scheduling aspect of that system - just to try and incorporate that into a bigger picture for some direction.

And in performing your work, did you liaise with Mr Pritchard?-- No, at that stage - he wasn't there really long enough to liaise with. George Mason and Phil Reed, who were there at the time, had a better handle on what day-to-day operations they were able to do, and were just a lot more practical. When you only spend a very limited time at the underground and try and schedule something, it wasn't a very realistic plan. A lot of the plans weren't very realistic.

Are you talking about Mr Pritchard's?-- That's correct. By being there, I was able to have a lot more hands-on feel of what was actually able to be done, you know, in the operation.

In the way you approached the task, you found Mr Mason and Mr Reed, because of their hands-on approach, or hands-on experience with the mine, had a better approach to it?-- They did. They were operating the mine, yes.

And one of the first jobs you mentioned yesterday was to identify pitfalls in the mine operation?-- That is correct.

Which had the effect of lessening production?-- That is correct, yes.

And that was, I think you said, part of the continuous improvement program?-- That is correct.

And you told us yesterday about the 450 tonnes per unit shift which might be called a "target production level" or a "desired production level"?-- On development, yes.

You mentioned, I think, 600 for extraction?-- Yes.

Did you look back to try and determine or identify reasons why the 450 tonnes per unit shift target was not being met?--

That was a principal reason why Mr Reed asked me to look at those particular issues, yes.

This is still at the time when you hadn't been appointed full-time?-- No, I was still a graduate at that stage.

Did you then examine three areas?-- That is correct.

Which were?-- From - to enable - to determine which areas needed to be addressed, I had to obtain that information from the undermanager's books. Looking back over at least - I can't remember - for two to three years back, I was able to identify three areas that required work. The first area was the availability of the continuous belting - the conveyor belt system - and then the second - the second issue was the methane drainage or the levels of methane that were in the mine, or in the development headings while mining was occur. Then the third, which was a little bit unclear at this stage, but just machine availability.

All right. Now, you identified those as being three areas where either work could be done or attention was needed in order to make the target tonnage more available?-- That's correct, yes.

Had conveyor belts already than addressed at that point?-- At the time I started there was quite an intensive program to upgrade all the conveyor belt systems at Moura No 2, and that had already been completed.

Well, did you form the view that that meant that that issue was being addressed properly?-- That's right. The frequency of down-time with regards the conveyor belts while I was there analysing the more recent information showed that there had been a marked improvement in the performance of the conveyor belts - the availability of the conveyor belts.

The second you mentioned was methane levels or gas in the mine. How was that manifesting itself?-- During mining operations, if there was more than the 1.2 per cent encountered at the face, the machine would trip off.

Is that by the monitors that are installed on the machine?-- On the machine - the Trolex or Bacharach - whichever ones we used, which physically suspended mining operations in that respect - in respect of panels. That was clearly the main area that needed to be addressed at that particular point.

And how did you determine to address that?-- Part of the - there was a system that had been put in place by Mr Draheim who used to be located at the open-cut for the degassing of the Moura D seam. What I found at that point was that there didn't seem to be a scheduled system where there would be enough lead time for areas to be drilled, degassed and then mined. They were doing that, but there wasn't - there didn't seem to be a structured system in place to sort of highlight critical paths for areas that needed to be available to be drilled, and therefore degassed.

That's important to a scheduling and planning engineer because you are looking to the future of the mine?-- It's critical, yes.

Did you then embark on organising a methane drainage program on a more formalised basis, higher profile than it had been given?-- That is correct, yes.

What was one of the problems with the miners in relation to operating gas drainage?-- One of the problems was the fact that the drilling was a very specialised part of an operation and there were specialised people that were required to drill. When there were shortfalls of labour in the panels them the first place that would be - the first place that men would be retracted from would be from the drilling crews. So using the continuous improvement system we basically sat the men that were - basically the drilling team, you can call them that, there were six gentlemen involved in that, we basically drew up cause and effect diagrams to highlight areas that were of concern and were - that required addressing for the maintaining of production of metreage.

When you say "we" did this, who are you talking about? You and the drill crew?-- Myself and the drill crew, Phil Draheim was involved, George Mason was involved and Phil was kept - and Phil Reed was kept in touch with what we were doing.

Was the idea to prioritise those six men to ensure they didn't get pulled off from the drilling?-- That was the first priority that was identified, yes.

Was that achieved?-- It certainly was.

And did that then let the continuous drainage program proceed with a little more smoothness and direction?-- That is correct, yes.

Did you develop a training manual for gas drainage?-- That is true. I never developed the training manual. Phil Draheim from the open-cut instigated the development of that training manual. We got consultants in to ascertain - to audit the system that we were currently operating with and in conjunction with that audit, and a gentleman - an independent gentleman to come in and drew up the training manual that has been - that is in the courtroom that's been listed.

It's already been tendered as an exhibit; is that right?-- That is correct, yes.

Who are those consultants that were called in for that?-- Ray Williams from Geogas.

Was there also a limitation or - perhaps not a limitation, but a feature of the distance that the drilling was capable of performing that was addressed?-- That is correct. There was a - because we were using the single shot survey camera to identify where the hole was, basically to steer it in the correct direction, that type of surveying equipment limited the operation to being able to drill only 400 metres - between

four and 500 metres, that's right, and that therefore became a panel design limitation too.

Just pausing there, does that have some relevance to the way in which the panel 512 was developed?-- That is correct, yes.

Perhaps you should tell us: how was its length determined?-- Prior to my arrival, this area -----

When you say "this area", just identify for us by some reference so we can pick it up on the transcript?-- The area of 510 to the end of 511 and down to the corner of 512, that block there, that had all been drilled from 1 cut-through in 510 in a fan pattern, therefore the limitation of the 400 metres, we had to drill straight ahead. The 400 metres was located to the end of the 511 panel and the 511 panel was finally finished with that step formation because of the limit of the length of those bore holes. We - obviously 400 metres in an arc cuts off the corner of 511.

And that was the area of pre-drained coal that was available to be worked?-- That is correct, yes.

And of itself defined the limits on the panels?-- That is correct, yes.

And is that what defined the length of 512?-- That is correct. The furtherest hole went to approximately 12 cut-through, that's what we could determine from surveying points that we obtained.

Now, when you went to the mine was it the case that 510 had just been started?-- It had just - that was the next area that we could develop into, yes.

So when you joined it was about cut-through No 1?-- They were at - no, we hadn't started mining in that area yet, but they had set up the belt and the transfer point to develop that block of coal.

And how far down 5 South was the mine at that point?-- At that stage the miner was about at 28 cut-through in 5 South, 28, 29 cut-through. That was just beyond that kink in the bottom roadway.

And had the area ahead of 5 South at that point been pre-drilled already or was that under way?-- No, that had been pre-drilled, yes.

So 5 South was available to continue development in that south west direction?-- That's correct, to 30 cross-cut, yes.

And at that point had the miners come out of 5 North West?-- Yes, I think they came out towards late 1991.

So was attention then turned to the 4 South area?-- That is correct, yes.

And did someone get brought in to give advice in relation to

panel design?-- Yes, Bernard Madden was asked - ACIRL was asked to come in to give us advice on how we could maximise our returns from that section of the operation.

If we talk about 4 South Level - perhaps you could just indicate 4 South Level for us on the map?-- The 4 South Level is basically this area in there.

That's the end of 4 South commencing at the junction of drives into 401, 402 and then south westerly?-- That's correct. I think it's cut-through 17.

Now, did Mr Madden give some suggestion for an approach to the panel in order to reach more coal?-- That's correct. He suggested that we use some sort of compartmentalisation system for two reasons; to be able to recover larger quantities or reserves, and secondly to be able to monitor the effects of the sandstone strata and find out what lodes were actually being transferred from the strata on to the remnant pillars.

At that point had 4 South Level been driven?-- Yes, 4 South Level had been driven except for the last cut-through.

That's the most inbye?-- The most inbye of the 4 South Level, yes.

And had the cut-throughs all been formed so that the basic pillar shapes -----?-- Yes, all that had been pre-determined, yes.

So Mr Madden's suggestion of compartmentalisation, how was that to be approached for 4 South Level?-- He suggested three stages of an extraction system. The first stage was to rib strip only one side of each of those pillars, to effectively monitor the stability of those remnant pillars as we retreated. The second stage was then to rib strip two sides of every one of those pillars, monitor that accordingly, and then the third stage was to be decided upon what results were obtained from stage 1 and stage 2.

Is that in fact what happened?-- That is correct, yes.

Was ACIRL monitoring the whole of that panel?-- That is correct.

Can you just indicate for us on the map where the first stage, that is a single pillar strip, finished?-- There were only three rows of pillars that was classified as stage 1. The second set of three pillars were stage 2. Bernard then insisted that he have a compartmental barrier pillar where the larger pillars go down to the smaller size pillars, and then stage 3 were the subsequent three rows of pillars outbye of that barrier pillar.

If we look at the map that's to your right can we see the barrier pillars that you referred to between those pillars which were punched and those which were rib stripped; is that correct?-- That is correct, those there.

And the use of a barrier pillar or a compartment pillar of that sort was Mr Madden's suggestion?-- It was his suggestion, yes.

And his suggestion was followed?-- That's correct, yes.

And in terms of the extraction of 4 South were there any difficulties?-- In what regard, sorry?

Well, did the panel produce any problems on extraction like in the nature of roof falls or floor heave or loose coal or CO make?-- No, there was no CO make problem. There were a number of roof falls. There was a zone of influence or structure that ran from the bottom corner of the 4 South Level across just before the barrier pillars and then into 401 and 4 South B. There was a structural zone that ran through there that induced some falls. Because the system - we had - because there were seven headings in that panel we - all seven headings were intaking air and the return air would come - was actually traversed through that roadway between 4 South Level and the 401 panel and returned up the 4 South return. So ventilation was a little bit slower. We maintained approximately 40 - 30 to 40 cubic metres in that panel.

That's, in a sense, an unusual panel because of the use of the return going outbye through 401/402?-- That is correct, yes.

Linking those returns is not something that's a feature of the mine otherwise?-- No, it is not, no.

Was the sequence of extraction then commencing with 4 South Level, after 4 South Level, 511?-- That is correct.

Then 403?-- That is correct.

Then 401/402?-- That is correct.

When you came to 512 were you involved in doing some pillar stability calculations?-- That is correct, yes.

And you did those and not Mr Madden, I think?-- That is correct, yes.

And did you utilise the information from 4 South Level?-- Yes, that information was utilised to design the 511 panel.

And one of the features of 511, can you comment on that in relation to the number of - or size of a pillar that were stripped and the mining height?-- We developed 40 metre centre line pillars that were to be rib stripped on two sides of every pillar to a mining height of five metres.

In 4 South had the pillars been of that size, that is 40 metre centres?-- No, they had been 32 by 37 if I remember - 32 by 40 metre centre line pillars.

So the 511 pillars were slightly larger?-- Yes, they were.

You mention the five metre mining height; did you calculate

the percentage of extraction in 511?-- Yes, one of the tasks that I tried to perform to evaluate what sort of production rates we were achieving was on a monthly basis and worked out on - I basically worked out a tonnes per unit shift on development and a tonnes per unit shift on extraction using actual values.

Did you then end up with a percentage for extraction

overall?-- That is correct, yes.

Was that about 54 per cent for 511?-- I do have a summary sheet here. I will just double check. 54 per cent, yes, that's correct.

How did that compare with 4 South level?-- At that stage - I haven't actually - I didn't actually back analyse the 4 South level. In Bernard Madden's report he has got a theoretical value, but at that stage I didn't, or up to now I haven't compiled a 4 South level actual tonnage.

What about the other features of 511 in terms of its roof performance?-- It was an extremely competent roof, sandstone roof, that we encountered with very little roof structure or deformation that was identified during development.

In 511 what was the position in relation to mining bottoms?-- Sorry, in -----

In 511 what was the position in relation to mining bottoms? Did they mine bottoms or not?-- Yes, we did, we took the full seam of five metres, yes.

Did that involve the use of a ramping method?-- Yes, we used a ramping method.

Not the same as 512?-- Not the same as 512, no.

But it was, nonetheless, a ramping method?-- Yes.

Were there any difficulties in 511 with CO make or incidents of heating, smells, the like of that?-- No, not that I can recall.

What about 4 South level?-- No, not that I can recall. The ventilation in the 4 South level in 1 heading at one stage was very, very slow. You could physically traverse the 4 South level No 1 heading as you could do some of the other - as you could do 511 to have a look inside the goaf, but there were no reports, or not that I was aware of, of any major problems.

Do I understand you right to say that you could walk the goaf in 511?-- That is correct, yes.

And in 4 South level?-- You couldn't walk through the middle of 4 South level. You could only walk in the No 1 heading in the 4 South level, the top heading.

Is that to do with that geological structure you referred to?-- No, not - well, yes and no. The top side you knew you were against a barrier pillar which provided better support than running through the - you couldn't run through the middle of the 4 South level. You never really ran through the middle of any goaf, you walked around the edges if you were able to.

That's what you understood to be sensible mining practice?-- Yes, life insurance.

Now, in relation to panel design, if I can turn to that. You were involved in assisting with panel design of, amongst other things, 512?-- That is correct, yes.

And I think you mentioned yesterday that there was effectively a team of yourself, Mr Schaus and Mr Mason?-- Yes, we worked as a consultative group, yes.

So that none of you would sort of branch off and do design by yourselves, it was done like a committee?-- We talked about it - you know, we talked every day. We would talk about different scenarios, and then because I was in the planning side of things I most probably had more time to sit down and draw panels up to be presented, so I would run a lot of different options, different ideas.

All right. Were there some options considered in relation to 512?-- Yes, there was, yes.

In the design of 512, Mr Madden was involved in that also?-- He was, yes.

Can I just ask you to look at some documents about that? Have you got with you some plans in relation to the development of the design of 512?-- That is correct, yes.

I want you to take this other document just to make sure that we are talking about the same thing and just confirm for me that the plans that I am going to ask you to look at in their sequence are reflected in the photocopy which I have just now handed to you. Make sure we have got them in the right order?-- Right, yes.

Are they correct?-- They are correct, yes.

I will hand a copy to each of the members of the panel and one to my learned friends. Now, can you just put the photocopy bundle to one side for the moment, the small one which I just gave you? Keep that separate because maybe I will use that as the exhibit rather than the thick bundle of plans. Now, when you were designing, or involved in the design of 512 there were some constraining factors, one of which we discussed before, and that is its length is determined by the extent of the pre-drainage drilling?-- That is correct, yes.

I am sorry, the gas drainage drilling?-- The long holes, yes.

Were there other design parameters, as it were, preset?-- Yes, for the 512 Panel there were a number of factors. The first factor was if you were - you looked at the map, the fan hole drilling pattern had left a large, or had left a wedge - what appears to be a wedge of coal.

You are indicating -----?-- In 512.

----- as it were, the southern triangle of the 512 Panel?-- That is correct, yes, that had not had any drill holes entered

into it. The first limitation was the 200 metre rotary Proram hole that we put into that wedge, then that physically determined the location of cut-through 13 of that panel. That was the first limitation. The second limitation was maintaining a barrier pillar between the 511 section and the 512 section. The third limitation was the barrier pillar between 5 - the proposed 512 section and the 5 South section.

Why did you have to have a barrier pillar there?-- Why did we?

Between 512 and 5 South, just to separate the panels?-- To separate the panels. That's what the idea of barrier pillars were.

Did it have to be a certain width?-- The Coal Mining Act states that it has to be a 45 metre barrier pillar so that you do not mine towards a potential inrush, which is clarified as less than 45 metres.

A potential inrush area is an area which has been sealed and in which gas may have built up?-- Gas or water, that is correct.

And 5 South wasn't an inrush area at that time?-- It was not, no.

And the barrier pillar, that is the barrier between 5 South and 512, was designed with that in mind?-- That is correct, yes.

Is that the same as between 511 and 512?-- No. In designing the 512 Panel we had to maintain - the dimensions that we looked at was the edge of the 511 Panel to the edge of the 512 Panel after extraction had to be 45 metres, so if you looked at your - on your first development workings, you included a 45 metre plus an eight metre rib strip, or seven to eight metre rib strip, plus four and a half to get to the middle of your roadway.

So, once you take into account the width that you need to have or have to leave between 511 and 512 and 512 and 5 South and given the length of the panel is determined by the drainage line and Proram hole, you face a number of constraints, don't you, in terms of panel size; you can't play with it?-- No, you had a predetermined block of coal that you could operate with.

Knowing that, can we go to the plans then and can you just tell us what the plans signify for us? The first plan?-- The first plan was an archive plan really before my arrival by Mr Pritchard.

Can you confirm that that's the first page of the small photocopy document?-- No, it is not.

All right. Well, plan No 1 we are looking at now is not in the photocopy document?-- Yes, it's not there.

This is an archive plan?-- Prior to my arrival Carl had conducted a feasibilty study to introduce breaker line supports into Moura No 2 underground, identifying that this - that block of coal, the 510/511/512 - that big block of coal was going to be made available in 1992/93 years.

And that was to be developed and extracted as effectively one block?-- And was going to be extracted as one block as the plan showed, yes.

Using breaker line supports?-- Using the breaker line supports, yes.

You couldn't do that without breaker line supports, that is, developing and extracting as one block there?-- No, you could without using breaker line supports, but it was just a plan that had been - that Carl had maybe put in place, or was thinking to put into place using that particular system.

All right. Well, in fact that system wasn't proceeded with?-- No, it was not, no.

You can fold that plan up and put that away. Did you have some discussions with Mr Reed and Mr Mason in relation to the 510/511/512 block and how it might be approached if one didn't use the breaker line proposal of Mr Pritchard?-- Yes. I - with Bernard - Mr Madden's ideas of compartmentisation of large - of blocks or panels, it was decided - eventually decided that we would break that big block of coal up into different - three separate sections. There were more benefits to be had by breaking up that block into separate sections. Ventilation was one, ability to seal off was a second, and it was just - it just seemed better mining practice to be able to seal off areas like that. It originated with the compartmentisation that Bernard Madden had - you know, had planted in our brains.

The idea was to use what Madden had developed about compartmentalisation?-- That's correct.

In the new block?-- Yes, that's right, yes.

Now, with that in mind, was a plan produced by you in relation to the design of the 512 Panel keeping those things in mind?-- That is correct, yes.

Is that the plan which is No 2; is that right?-- That is correct, yes.

And it's the first plan on the photocopy bundle?-- That is correct.

That was in fact plan No 2 in the sequence of plans for 512?-- Options, yes.

Options?-- Options, yes.

As we look at that plan -----?-- That plan was actually drawn up as a mirror image of the 511 section right next door

to it.

Same pillar size and so forth?-- Same pillar sizes, same method of extraction, same location of belt road, same method of ventilation up the top return, etc.

In relation to a panel such as that which has five headings going in, what can you tell us about the ventilation parameters that would apply to it?-- The ventilation parameters?

Yes. I mean, in terms of approaching ventilation, what does one do when looking at this? You have to have a supply road and a belt road. What follows from those things?-- Well, before anything else gets assessed - because we were a gassy coal mine, flanking returns were - was the first - was decided upon, we were going to have flanking returns on each side of the panel.

And that's for development?-- That's for development, that's correct.

And in a gassy mine, as you understand it, is that an important factor?-- That is good mining practice. We then - you locate a belt road and a supply road from your system.

If you had flanking returns, neither of those could be the belt road and the supply road, could they?-- No.

So, you are only left with three possible headings that are going to be the belt road and the supply road?-- That is correct.

And one obviously gets designated for that?-- That's correct.

And the other two are intakes?-- That's correct.

The belt road is an intake as well?-- The belt road is an intake, so you have three intakes.

If one has the system of flanking returns for development, does that also lead to some other features at the bottom of the panel when you get to the end in terms of directing air?-- The air was - I mean, the system that was in operation at Moura was to - we were asked to ventilate the goaf. At the bottom of the panel you would construct stoppings with doors in them to force the air to the most bottom part of the panel and then via the top return and via the bleeder return.

And that was the system that was already in place at Moura when you arrived?-- That is correct, yes.

And had been, so far as you could determine, developed over long years of practice?-- That is correct, yes.

As we look at this plan, can you tell us about some of the features of it, how to identify the features of it?-- If we start from the top of the panel, between - from right to left

there is an indication of a stopping with two - by two lines.

That continues down every cross-cut to the bottom of the panel?-- That is correct.

Does that indicate that the heading to the right of those is the return?-- That is correct. In cut-through 2 there is an indication of a triangle, coloured in triangle, which indicates the boot end, and then the two squares next to it are basically the shuttle car, for which direction that they would actually be anchored or run to. The sequences - the numbers on the plan indicate development sequences, and the shaded in areas on the pillars below indicate a system of - a sequence of - on the extraction.

Now, was that plan produced to determine a number of general things about 512?-- Yes, it was an option in that block of coal that we had available to us.

General layout?-- General layout.

Barrier location?-- That is right.

If any extra drainage was required, this plan would reveal it?-- That is correct.

And this plan would enable you to work out tonnages and so forth?-- That is correct, it was utilised for - to indicate on a plan a scaled impression of what was possible, also depths of cover and then safety factor calculations.

All right. Put that plan to one side. That was a plan revealing various options, or at least general matters relating to 512?-- In '92.

In '92?-- That is correct.

Did discussions about 512 then continue and further plans were developed?-- From - really 512 only became a point of discussion as we got closer to - more a point of discussion after the 401/402 panel.

In other words, closer to the time when you actually had to start doing something with it?-- That is correct, yes.

Did that result in a second consideration or a second set of options?-- That is correct, yes.

Is that the next plan?-- No. Panel - plan 3 was done by myself, or drawn up by myself. The long hole drill holes - a bit of a mouthful - when we were developing the 511 Panel were obviously intersected in the top return. Prior to extraction we knew that we had to seal or block those holes in the top return so that when we ultimately sealed the 511 Panel we would - and subsequently drove the 512 that we wouldn't intersect any open boreholes.

Now, this plan shows the location of drainage lines and also identifies holes grouted and holes marked for the purpose of grouting?-- That's correct, yes.

Is this the second plan in the sequence of small photocopy plans to your left?-- That is correct.

And nothing has been changed in relation to the design layout of 512. This is really to do with gas holes?-- This is more to do with location of gas holes that were grouted, yes - action taken on the grouting of the boreholes.

You can put that down to one side. Then in 1993 did you use another plan for the consideration of those involved in the drafting of the design for 512?-- That is correct, yes.

And is that the next plan which you have - plan No 4?-- That is correct.

That's the third physical plan in the bundle?-- That is correct.

And it is headed at the top, "Draft" and the scale is 1:1250?-- That is correct.

Just tell me about what this plan shows. Why it was produced and who saw it and what does it show?-- Again, this is not different to anything else, in the sense that it identified the block of coal that we were able to attack, so to speak, or that we had available for us to work within. From the 401/402 panel, we looked at different - possible different types of mining scenarios in the take a row, leave a row, and this was a base plan for something like that to be drawn upon - as a draft case - and then different options to be placed on there. The only difference between this and the previous - or the original '92 panel that I had drawn up was the fact that the belt road now is located in the middle of the panel.

How did that come about?-- That was a decision that Albert wanted to - or that Albert made so as to improve productivity on our mining sequences.

In the 511, the belt road being at the top of the panel?-- That is correct.

And did that mean in a panel such as 512, or even 511, longer wheeling for the shuttle cars?-- Longer wheeling was required to get to the extremities of particular bords, but putting the belt road in the middle, it gave us a better productivity rate.

So that determined, at least at this stage, the preferred option for where the belt road would be?-- That is correct. The other thing that I failed to say earlier, limitation-wise, is that there was already one pillar established off the 510 panel.

Is that between 0 cross-cut and 1 cross-cut in 512?-- That is correct. The pillar formed was the - between 2 and 3 heading,

0 cross-cut to 1 cross-cut, 512. That pillar had already been established.

Right?-- For us to - to enable us to put the belt road in the middle of the panel, we required to shave a bit of that corner - a bit of the - some of that heading between 1 cut-through - 0 cut-through and 1 in number 3 heading - that's indicated by that dashed line.

In other words, you needed a straight drive for the belt to run up?-- That's correct, yes. Therefore, that pre-determined your pillar dimension between heading 1 and 2, and 2 and 3 at 30 metre centres, so that was another predetermined limitation on that block of coal that we had.

And that still left the large block between what's designated there as belt road and what we call the bottom return for splitting into panels - pillars, rather?-- That is correct, yes.

So, at that stage of the discussion, the length of the panel was effectively predetermined by other factors. The belt road was really pre-determined - or if one wanted it in the middle, it had to be in that heading?-- That is correct, yes.

And that also gave you, then, the distance between 1 and 2, and 2 and 3?-- That is correct, yes.

And left the rest to be discussed?-- To be discussed, yes.

This plan, I think, was given to a number of people?-- Yes, Bernard - well, I drew it up, Albert and George were aware of the limitations, and that was given to Bernard as a starting base, so to speak - you know, it was a draft that we could then put - then scribble on, you know - different options.

It was provided for him to consider?-- That's correct.

As discussions progressed, did you - I will just pause for a moment. Just staying at that stage, there were some discussions that you were party to in relation to what method of mining would be the preferred method for 512; is that so?-- That is correct.

And is that the take a row, leave a row that we had been discussing?-- That had been developed in the 401/402 panel.

Was there also a preferred option or preferred design in relation to pillar size?-- The 30 metre centre dimension was the optimal size for - on a productivity-based analysis.

And in terms of determining the panel design for 512, was any notice taken, and if so what, of what had been learned about 401/402 in the monitoring by ACIRL?-- That is correct. That's the basis of Bernard Madden's interpretation of what was possible in Moura Mine in the way that sandstone behaved.

And then were some more specific options then developed and discussed?-- That is correct.

With Bernard Madden, amongst others?-- That's correct.

And is that plan 5, the first of the options, and is that the fourth physical page of that small photocopied bundle?-- That is correct. This was an option that I had looked at and then used to - that I had used to throw up as - you know, a possible system.

Was this an idea to take into account - take a row, leave a row?-- Instead of take a row, leave a row, this particular system was a development of small pillars all the way in, and then just an extraction of the bottom side of every pillar, taking bottoms all the way around.

It was just an idea put up by you into the melting pot?-- It was an option, yes.

Was it embraced by Bernard Madden?-- Not really. It didn't - it didn't go with the system of a take a row, leave a row, but like I said, I was just there to throw - there were options that were brought up. I would draw them up and look at them, see what we could do with it, and then we would make a decision on that particular design.

But this plan was provided to Mr Mason, Mr Schaus, and Mr Madden?-- That is correct, yes.

So, at the planning stages, at least to this point, whenever an option was discussed, everybody had, in fact, a document to work on or-----?-- We had something to reference off, yes.

It wasn't just people sitting around drinking cups of coffee or anything like that?-- That's right. It was something to reference off.

Did a second option then come to light - plan number 6?-- Sorry, if I could just-----

Sorry?-- The other plans had not identified - had identified clearly the way we attacked that wedge of coal.

Oh, yes, I'm sorry, that is correct. Is that revealed on here?-- That is correct. Those lines are straight lines, but rotary drilling - I'm not sure if rotary drilling would create straight line holes, but that was a general idea. That was a plan.

And are these what we have heard as being Proram holes drilled from 5 South in 512?-- That's right, with cut-through 13 - to the extent of cut-through 13 with a 200 metre rotary hole, or 175 and 200 metre rotary hole.

And they are the dotted lines marked on there with the distances in the 5 South?-- That's correct, yes.

Now, was there then another option brought to light under plan form and considered by those who were looking at 512? Is that plan number 6, and is it the 5th page of the small bundle?--

That is correct. That was just another option again - to develop 31 by 37 metre small pillars; have the ability of taking the bottom side of every cut-through. What ultimately Albert wanted to do for Moura No 2 was to be able to develop a mine that didn't require any extraction system; in other words, just to be a purely first development operation, and we had many discussions with regards whether we could or we couldn't and how we could try and phase that system in. I mean, it wasn't something that would happen overnight. It was a culture change that had to go with the Moura personnel. There had to be machinery changes. But he was ultimately looking to develop a pure development mine.

And, in a sense, that's a good position to be in, because you don't have all the worries of extraction and so forth?-- That is correct, yes.

You take all your coal on the way in?-- That is correct, yes.

Or all the coal that-----?-- All the coal that you possibly could.

On the way in?-- That's right, but we needed to develop a lot of other systems and machinery and that was - those were issues that had to be addressed. This particular plan, plan number 6, identified that where we would - what we were going to try and do was evaluate a cut and flip mining system that hadn't been introduced into Moura as yet in this panel to see if we could improve development production tonnage rates, but then also having your cake and eat it at the end of the day by - if that didn't work, look at just maintaining the big 40 by 40 metre pillars so we could rib strip both sides of the pillars to try and maintain our tonnages for the year.

So, you effectively take - split the panel in two with small pillars and large pillars?-- That is correct.

And on that scenario, which would be extracted? The large or the small?-- Both would be extracted. The large pillars you would take two sides of every pillar - that's not indicated on this. The 40 by 40 would be an indication of the very first 1992 scenario, and then the 30 by 37 was just to extract the cut-through.

And both this plan and the one before were designs generated by you, not by Bernard Madden?-- Not by Bernard Madden.

Even though they were provided to Bernard Madden in order for him to evaluate it?-- Yes.

Is there any other feature of that plan that we need to consider just at the moment?-- No.

This one and the last one are still predicated on 5 metre mining lines, aren't they?-- Yes, that's correct.

Put that down. Was another option developed in plan form and provided, as the others were, to the team - development team, including Mr Madden?-- That is correct, yes.

And that's plan No 7. Confirm for me it is the 6th page of the bundle, please?-- That is correct.

Now, in relation to this, this plan differed slightly because in the middle it has got a barrier compartment?-- That is correct, yes.

Now, how did that come about?-- This is the take a row, leave a low scenario on 30 by 30 metre centre pillars.

Can we see that by the letters T & L?-- That is correct, yes. It was a decision made by Bernard Madden that if we were going to take a row, leave a row, as we had done in 401/402, that he wanted a barrier pillar in the panel - somewhere within the panel. One of the options was to locate a single row of barrier pillars - one compartmental barrier pillar in at the half-way mark, and this was it at a 40 metre centre.

Is that an option that was discussed between yourself, Mr Schaus, Mr Mason and Mr Madden?-- Yes.

An option was a compartment pillar right across the middle?-- That is correct.

And that's got reflected in this plan - this is also predicated on 5 metre heights?-- That is correct, yes.

Taking bottom coal?-- Taking bottom coal, that is correct.

And, again, the belt road position not really moving?-- In the middle of a panel, yes.

For the reasons that were discussed earlier?-- That is correct, yes.

That shows, at least in prospective form, the way in which, as we look at the plan, the left-hand side of the panel might have been carved up - that is, the headings 4, 5 and 6?-- Headings 4, 5 and 6 were split up between that - there was 90 metres of coal there that we could do something with. The 30 metre pillar size just fitted quite well with that pillar - with that block of coal dimension.

Now, as you look at this plan, the drives between 0 cross-cut and 1, there are 5 in total and the numbers 4 and 5 are with dotted lines. What does that signify?-- That indicates that that level required to develop those particular roadways. The No 1 heading, as I have it there, also required development, but I didn't signify them with the dotted lines.

The No 1 heading?-- The No 1 heading between 0 and 1.

Okay. That option was considered by those who were interested in the design of this panel?-- That is correct. Bernard Madden used this option and the next option as part of his analysis for the model that he had to give us a-----

And did he come back and give some view about whether he

wanted one set of compartment pillars or two?-- He was emphatic that he wanted two compartment pillars.

He wanted two?-- That is correct.

Two in the panel itself?-- That is correct.

And is that how plan No 8 came to light, reflecting Mr Madden's view or insistence on two compartment pillars or lines of compartment pillars in the panel design?-- That is correct, yes.

And is that plan No 8 - I think it is the last page of the small bundle?-- That is correct.

All right. Now, as we look at plan No 8, we again have some given factors: the belt road, the spacing of No 1 and No 2, the Proram holes, defining the length of the panel, and you have mentioned the barrier pillars between 511 and 5 South in order to define the width of the panel?-- That is correct.

And did this plan reflect what Mr Madden wanted in relation to compartment pillars?-- That is correct. That was the first draft, yes, of what he wanted.

And this was given to him to assess?-- That is correct.

And did discussions follow after that was given to him?-- Yes, there were - he had to - he had to go to Wollongong and then analyse the system, and basically construct the model that he was going to use to evaluate the remnant pillars and the mining system that we were going to develop.

And did he explain why he wanted two?-- Yes, he had to evaluate the regional stability of that panel. Up to Bernard Madden being involved in the 401/402 we had isolated - I had evaluated pillar stability on empirical basis on individual pillars. This system of mining, of taking a row, leaving a row, changed that concept altogether from an individual pillar strength because it was not - because we weren't leaving remnant - uniform remnant pillars in the goaf. So I didn't have the capability to analyse that type of panel design.

But Madden did?-- But Bernard Madden had the ability to do that, yes.

The proposed extraction sequence plan which was drawn up eventually and approved, did that receive the approval of Mr Madden?-- Yes, it did.

On plan number 8 as with the final one, on the basis that there was going to be cut and flit, take a row, leave a row is it predicated on flanking returns?-- Yes, all on flanking returns, development on flanking returns and bleeder return on extraction.

Which leads on extraction to the main return being where?-- The main return being on the top side of the panel.

You've discussed the practice at Moura before about directing the air. You can put that to one side. I will tender those plans as a bundle together with the small photocopy bundle for cohesive use and they can perhaps conveniently be made one exhibit.

WARDEN: Those documents admitted and marked Exhibit 157.

ADMITTED AND MARKED "EXHIBIT 157"

MR MORRISON: I am about to move to a different point.

WARDEN: We are about to move for lunch. We will take the lunch adjournment, gentlemen and resume at 2.15.

THE COURT ADJOURNED AT 1.01 P.M. UNTIL 2.15 P.M.

THE COURT RESUMED AT 2.15 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MORRISON: Mr Abrahamse, when we last spoke to each other we were discussing the development of the design of the 512 Panel and I took you through those maps and we got to the stage where we were discussing the fact that the Part 60 extraction plan was the sequential plan from the ones that we had been discussing and reflected Bernard Madden's insistence on two compartment lines of pillars?-- That is correct, yes.

You were asked some questions by Mr Clair about whether at that stage anyone had discussed with you the questions of ventilation impact the pillar design would give; do you recall some questions to that effect?-- From Mr Clair, yes.

He is the only person before me who has asked you questions over the last few days. At that stage amongst the three, that is to say Schaus, Mason, yourself and Madden, did any such discussion occur about the ventilation impact of the design itself?-- No, not of the design.

Did anyone else raise that with you?-- No, no, we didn't.

I want to confine you for the moment to the design stage and perhaps the early stage of the panel. I'm not talking about extraction stage, I'm talking about design and perhaps early stages of development. Did anybody raise with you concerns about the design and the impact that that might have on ventilation?-- No, no, there was no concerns about that at that time.

Let me specifically ask you a couple of names. Did McCamley ever raise with you supposed concerns he had about the design of the panel and its impact on ventilation?-- Not in the design stage of the panel.

Was that raised later on with that re-circulation or that layering effect in June?-- No, he as an undermanager thought that the large compartment pillars were difficult to develop being the dimension that they were and then the physical - part of the mining operation where they had to wheel around the compartment pillars, it was a mining hassle, you know, to wheel for long distance and then have a combination of 55 by 47 metres of brattice bag to ventilate the face.

His concern was to do with the impact on wheeling and the amount of brattice or the configuration of brattice that you would need?-- That's correct, that's what I recall.

What about Robertson, Reece Robertson? Did he ever raise with you such concerns in the design stage, early stage?-- No, not - Reece didn't come to me with any problems about the design stage of the panel.

Let me ask you a third name; Peter Rose, did he raise in the design stage or early stage, concerns about how the design would impact on ventilation?-- No, I don't remember Peter coming to me at all.

Now, there was a question that you just mentioned about

McCamley raising some matters about the length or the complicated nature of wheeling around such pillars?-- That is correct, yes.

That's a different matter again to ventilation, isn't it?-- Yes, yes.

You in fact went into the 512 Panel on quite a number of occasions, didn't you?-- That is correct, yes.

How many overall roughly?-- Just one moment. From my diary there were a total of - I had a total of 21 occasions that I went into the 512 Panel in total.

What's the split between extraction and development?-- On 13 occasions I went into the panel on development and then eight during extraction.

You've heard and you've been asked about people talking about dead spots in this panel and I think in particular dead spots behind the big pillars. What can you say about that yourself from your own observations of being in the panel?-- From a very practical point of view the areas behind the compartment pillars we actually installed an extensometer in one of those big pillars. The term "dead spot" to me is an incorrect term, in my opinion. A low velocity area may be more pertinent. The only reason I say that is because when walking down the bottom supply road, the bottom supply road because it wasn't used as often as the top supply road, was a little bit dustier, coal dust and stone dust. When you traversed it on foot you would physically kick up dust. The dust never sort of hovered around you as if it was a dead spot. It would move on.

Was that invariably the case when you were down there?-- In the time when we were putting the extensometer points in it would have been the case during those incidences, yes.

Those extensometer were part of the ACIRL monitoring program in relation to 512?-- That is correct, yes.

There was an extensive program of monitoring carried out for 512, wasn't there?-- Extensive, yes.

And that required you and individuals from ACIRL to be in the panel fairly frequently to take measurements?-- Yes, there were quite a number of occasions that the ACIRL people and myself were involved in - and other people were involved in obtaining readings, that's right.

And at least one of those extensometers was into a large pillar?-- In one of the large compartment pillars that's correct, yes.

So it required people to move to that area with some frequency to take readings?-- No, the actual instrumentation was in the larger pillar.

Sorry, the readings were in 5 South, were they?-- The readings

were in 5 South, but there were also instrumentation that were put in with the ACARP project.

Perhaps you just better explain what that project was?-- It was - ACIRL, from my understanding, had got a grant from the ACARP group to identify thick seam mining operations and identify what hazards were associated with a thick seam mining operation. They then came and installed equipment at the cost of ACIRL and for us to just monitor that information, supply it to ACIRL and then by being part of the ACARP group that information from different mines would then be able to be given to Moura Mine to share that information.

And likewise the Moura information to other mines as well?-- That is correct.

So people were required to take readings as part of the ACARP program within the 512 Panel?-- Yes, the actual readout box was located within the 512 Panel. The instrumentation that Moura Mine paid for was located in the 5 South bottom return.

I just want to ask you one other thing. You've heard, and I think been asked about whether you were aware at the time or subsequently of some ventilation problems, a reversal that was had on 17 June, the one where Mr McCamley and Mr Morieson and Mr Robertson went on a detailed inspection. Do you recall that incident?-- Yes, I do.

I think you said this morning - maybe it was yesterday - that you hadn't heard about that at the time you were on leave?-- That is correct.

You had been told some details of it by Mr Schaus in a phone call?-- In a phone call from Sydney, yes, that - I had rung Albert, yes.

Was that phone call while you were on leave?-- That is correct, yes.

Can you comment on any difficulties experienced with ventilation in 4 South Level that were similar in nature to that?-- The only problem that I can recollect is that in No 1 heading, because we had seven intakes into the one return the velocity was slower in that No 1 heading and that was - a bit of work had to be done with regards trying to regulate the quantity of air flowing down that No 1 heading.

Were there in fact some occasions of reversal of ventilation in 4 South Level?-- Yes. I'm not sure if it was reversal, but there - there most probably were, I'm not 100 per cent sure on that, but I know there were problems with that No 1 heading.

And similar problems in 5 South?-- In 5 South, the development panel?

Yes?-- Inbye of the 20 cut-through. It was brought to my attention quite considerably earlier than '94 that when we

stone dusted in 5 South that sometimes the air would travel up the belt - the stone dust would travel up the belt road.

So the reversal incident on 17 June in 512 was not, by the sound of it, something that came out of the blue, not the first time it had been encountered, perhaps in 512, but not in the mine?-- No, no, there were other occasions. I remember the 5 South in particular. The 4 South Level I'm not 100 per cent sure on.

The method of mining in 512 as we know it involved ramping?-- That is correct.

In a fan shaped pattern sequentially to take bottoms in sections and bottoms inbye ribs?-- That is correct.

Can you recall how it is that the ramping came about and what constraints were placed on it?-- The ramping came about as a consequence of Dave Camplin on night shift breaking his leg by a piece of coal falling between him and a shuttle car.

Can you pause there and - that wasn't in 512, was it?-- No, beg your pardon, that was in the 4 South B. What we call the 401/402 panel -----

Point it out on the screen for everybody's benefit?-- It occurred in that part of the operation.

It's like a sub panel at the mouth of 401/402?-- That's correct. The panel 401/402 had been extracted and we were moving to the prep seal site which were located at 1 cross-cut in the 4 South B panel, what we call the 4 South B panel.

This chap broke his leg, there was an investigation and an inspector's report?-- That is correct, yes.

What was the result of that investigation? Did Mr Walker require something to be done?-- The investigation established that there were older areas in the mine that had been - that had been rib bolted with what we call wriggly bolts and those wriggly bolts had been phased out and we were using the standard - our standard roof bolt angled to secure - to be secured into the roof strata itself. So there was a difference in rib support from older areas of the mine that we had - that had been developed a considerable time ago compared to what the current standard was. The inspectorate asked us to - that prior to any other extraction in older areas that we we were required to update older areas of the mine to the current rib bolting standard.

Did Mr Schaus impose a restriction in relation to rib height?-- Yes, the ramping was the result of ensuring that we did not expose any of the operators to heights greater than three metres.

That wasn't something the inspectorate laid down?-- No, I don't think that was set down by the inspectorate, it was - it divulged from discussions. Obviously I wasn't privy to the discussions between Albert and Mike, but the discussions that

were held came to the reasoning that maybe we should, you know - we wouldn't expose anybody to high ribs. How we would make sure that people weren't exposed and one of the options was to make sure all bolting was systematically done and to - to the current standard and that no operators were exposed to more than three metre mining heights.

The actual method of ramping was proposed shortly before the Part 60 submission went in; is that right?-- That is correct, yes.

And were you asked to draw up the mining sequences for the panel?-- Albert Schaus had already drawn up the sequences. The proposed ramping and fanning from your punch into your heading, and he asked me just to tidy it up and put some headings on so that it could become part of the Part 60 proposal.

And that procedure for ramping was in fact part of the Part 60 proposal, wasn't it?-- That is correct.

And approved by the inspectorate?-- That is correct.

Can I ask you to consider another matter if I could? You mentioned in answer to Mr Clair that you had been aware that the Moura seam was one liable to spontaneous combustion?-- That is correct, yes.

Now, in terms of day-to-day activities what can you say about the occurrence of that?-- The day-to-day activities?

Yes, occurrences of spontaneous combustion and one's day-to-day activities and what you see day-to-day in Moura No 2?-- Other than the CO makes on a week - during extraction on a Friday, there weren't any really. There was one incident that we knew of.

Which was?-- The 5 North.

That was in 1986?-- In '86, that's right, yes.

And none since?-- No, not that - there was - in '91 I was made to believe that the manager at the time, Mr Reed, was concerned that he had a CO make of 12, I think it was that time, but his main concern was the fact that it was - he was getting a bit of roof convergence in a zone that he encountered in the 5 North. He was not able to inspect the goaf and he wasn't sure what effect that would have on the seals inbye of the 5 North and therefore he suspended all operations and sealed up that panel.

Would you just turn around to the plan? The areas you are just mentioning, perhaps you can indicate them for us. You are talking about the seals inbye of 5 North of the area - rather inbye of the area that the roof problems were encountered. Can you demonstrate first where the seals were, and secondly the area of roof that was of concern?-- The first area in '86, the sealed areas are located where those large pillars are.

That's about half-way up the north west angled part of 5 North?-- That is correct, yes.

And where was the position of 5 North West where the roof was causing concern in '91?-- The area was in that general area there in the intersect - just about in the intersection.

Intersection of 5 North West and 5 North?-- That is what I was led to believe, yes.

So apart from that incident in '86 then, so far as you are aware there hadn't been another incident of spontaneous combustion since then?-- I was not aware of any others, no.

And you didn't have to confront them day-to-day obviously?-- No, we didn't.

you mentioned to Mr Clair that you were a Mines Rescue member having joined in '92 and having done the Mines Rescue course?-- That is correct, yes.

Is that a course of A fortnight's duration?-- Two weeks, yes, full on.

Subsequently having done it did you undergo any refresher training of any sort?-- Every second month we would have to go under what they call oxygen time. When we went under oxygen time we would run under - Dave would have a little bit of an exercise, whether it be running in the gallery, smoke gallery, whether it be using the different types of instruments or just conducting bag samples underground or building prep seals underground under the suit conditions.

There were other members of the mine who participated in Mines Rescue and we have seen a list of names, but were there some very experienced deputies in that brigade too?-- That's right, there were.

Was John Blyton one of those?-- John Blyton was the captain at that time of the Mines Rescue team.

What do you have to do to become captain? Is it just something you are elected to?-- No, you've got to be quite an experienced member of the Mines Rescue team and therefore onuses on you as a captain not to undertake work, but to assess situations underground and make decisions on those situations. They don't actually physically build prep seals or dig sites for prep seals, they - their task is to monitor the people - a captain's duties is to monitor the people that he has with him and also make assessments of conditions underground.

Is that, in a sense, one way in which Mines Rescue training actually translates across to the actual practice in the mine?-- It would do, yes, yes.

Blyton was the captain; how long had he been there roughly, do you know?-- I don't honestly know. He was captain when I

arrived at Moura No 2.

At least a couple of years then?-- Yes, yes. I don't honestly know.

Len Graham was another long serving Mines Rescue member?-- That is correct, yes.

As part of the course that you did at Mines Rescue did you get told things by Mr Kerr about spontaneous combustion and the signs of it?-- Yes, we were.

Can you give us an idea of how detailed that was and what topics might have been covered?-- We were given the Mackenzie-Wood book which we were asked to refer to at different stages of the course. The main thrust that I can remember of the CO course was to calculate the CO make, to be proficient enough to calculate the CO make. That entailed being able to use an anemometer correctly, understand the workings of an anemometer and be able to use it correctly, the understanding of using a Drager 21/31 and then the tubes associated with it, and then understanding the method of calculating a CO make, understanding that you have to ascertain the cross-sectional area and then the formula to make the CO make.

In the exercises that you did after the initial course did Mr Kerr actually run people through some sort of exercises to do with CO make?-- Yes, we had walked down underground on an exercise to collect bag samples. We'd carry the stretcher, Dave would walk behind us and he would just rattle off a few questions and ask us to answer it as we walked inbye to different areas.

Such as?-- One question being what is the formula for - to calculate a CO make and, you know, he'd be looking for someone to give an answer.

Would he get that sort of answer?-- Yes, he would, yes.

Can I ask you this: in his discussions with you about, say, the signs of spontaneous combustion did he give you any practical examples of things that he had experienced or witnessed himself in terms of the signs and haze in particular is what I'm thinking about?-- Yes, I'm not sure if it was Dave Kerr or at that time the superintendent from the Middlemount station, but they would ask - they would relate the stories of what they had had happen to them over the years, especially Dave's stories about different fires underground that he has had to cope with and that he has experienced and, you know, the Laleham incidences and the explosions, I think, at - I can't remember - around the Blackwater area, but Dave was - had fairly - a fairly wide knowledge and experience in analysing what to find or what to identify if a fire -----

And did you hear anecdotal information or other information

from other sources, other persons such as Mr Reed in relation to that sort of experience?-- There were occasions when not only Mr Reed but other Mines Rescue personnel would indicate to you - being the fresh person in the Brigade, you would ask questions, "Well, how would you identify those sort of things?", and people would say - the first thing they would say is the smell, "a smell you would never forget", "a smell that once you smelt you would know, you would recognise". Those are the phrases, you know.

Not a very helpful description?-- No, no, but - no, not a helpful description, but they talked about a toilet being knocked over as one example. Mr Robertson - Reece Robertson - one of his expressions - one of his quotes is, "Yeah, it smells like a toilet knocked over." and you would smell that. I personally hadn't smelt anything like that up to that stage.

So, the exchange of information about signs and so forth was not confined to any formal course done by Kerr?-- No, definitely not.

And there is a fair exchange of information from personnel at No 2, one to the other?-- Personnel at No 2 and Mines Rescue, or Moura Mines Rescue Station had been involved in quite a number of incidences in the Queensland area.

Now, you mentioned earlier that you had received a book from Mr Reed, "Mine Ventilation Practices". You might have said that yesterday, I think, when you were talking about -----?-- From Mr Reed?

Did you get a book from Mr Reed, "Mining and Ventilation Practices in Coal Mines Liable to Spontaneous Combustion"?-- When Mr Reed left there was a period -----

You purloined it?-- I took his book. The office he was in, there was some books there. That was one of the books I picked up.

And there were some manuals as well that you took?-- Yeah, there was a symposium, an oral symposium, on thick sea mining operations; a lot of papers, European papers; there was a conveyor belt manual to work out what sort of criteria - what sort of formulas you need for your conveyor belts.

And you had the Mackenzie-Wood's book?-- I had the Mackenzie-Wood's book.

Or at least the first issue of that?-- Yes, at that stage.

Had you read some reports from mine incidents in the past?-- The only one I actually have read is the No 4 incident, and that was given to me by Mr Reed.

Can I just ask you another thing: did you get any anecdotal evidence of other signs? You talked about smells before. What about hazes, did you get any anecdotal evidence from anyone about the sort of haze that can be encountered and its

characteristics?-- Yes.

I mean, not haze in relation to spon com necessarily, but hazes in mines?-- Yes. Another incident at No 2 was the 2 North seals that had collapsed due to - from historical evidence a pillar collapse in the section.

Could you just turn around and indicate 2 North? Do you need another plan to see it?-- I am just trying to remember the exact area.

I will give you a plan with numbers on?-- There is a document that the inspectors have got of all the locations of all the seals and where they were.

I just really need to know the position of 2 North rather than where the 2 North seals were?-- The precise location of the seals were across that area there.

You are indicating, as best my eyes tell me, the white area?-- That's right, yes, where the seals are. That entire panel there is called 2 North. It was that area there.

So, a lateral white mark about two-thirds of the way up the 2 North main drive?-- That is correct, yes.

That's where the seals were. Now, who did you hear this information from, was that Mr Reed?-- From a number of people. From Mr Reed and from - in conversation with Mr Reed and Mr Byron. They were down at the seals on that occasion.

Can you just tell me what they related to you?-- Basically they - there was a problem that one of the seals was leaking and they went down to inspect it and as they approached the seal - well, they got out of the Rover and were walking towards the seal, and the seal actually collapsed at that stage. There would have been 98 per cent methane behind the seal. At that time they laughed about running all the way - running a couple of pillars out and stopping to test it with the equipment that they had and then continued to run all the way out. When they actually stopped, what they thought was very surprising is that the methane itself that had come out of the goaf stopped in one of the headings that they - the heading that they were running out of and they were - whether it be because the ventilation pressure was enough to push that wall of methane back - I don't know if it would have laid on the roof, but, anyway, they could see a wall of - you could nearly class - they said they could classify the difference between the higher concentration of methane and the good air, and when you shine your light into the heading you would see a shimmer.

A shimmer?-- Like a - yes, a shimmer.

So far as you understood what they were telling you, they were in fact discerning a shimmer from methane concentrations?-- That is correct, yes. I mean, there have been other instances where Dave Kerr has mentioned about this same shimmer of light when they re-opened the 4 South panel.

From methane again?-- From methane again, yes, that's correct.

Now, can we turn to your movements around the mine? I understood from what you said yesterday that you accompanied Allan Morieson a lot as he moved around the mine?-- In my first year at the mine as a graduate, the only way to get around and understand where - what different parts of the mine looked like is to physically traverse it on foot. Because Allan was the - was looking after - he was the stone dust officer as well as the fire - well, the fire officer looked after collecting stone dust samples, he would go out to all of the out-of-the-way places, and I accompanied him on a number of occasions in that first year that I was at Moura.

In the time that you accompanied him, or he was taking measurements for ventilation purposes, are you able to say anything about the way in which he went about it, not whether he did it well or good but the system that he had for taking it? Was that something you were involved in developing, or did he have that already?-- No, he had that well and truly developed. He would - with regards taking ventilation readings with the anemometer, you weren't supposed to be in his direct line, and he would take the anemometer reading from one side of the rib to the next and then traverse in the opposite direction and then conduct a third time, and if his readings were as close as - if they were very close or spot-on on two occasions, he wouldn't take a third reading. If they were slightly different, he would take the third reading.

Did he have a particular system that he followed in relation to taking CO readings as well?-- The CO readings -----

Locations and how he would do it?-- He had designated spots that he would go to, vent stations as such, yes.

Your involvement didn't involve changing that system?-- No, no, I wasn't there to change the system.

You were involved in documenting it?-- That's correct, yes.

From what you could gather from him, had he been following that system for some time?-- From what I understand, he had been the ventilation officer for a good period of time before I arrived there, yes.

When you first arrived and - was CO make being kept for whatever panels were being extracted at that point?-- That is correct, yes.

And where was the information being taken once they were done?-- Well, while I was there at No 2 underground Allan - I would go down and we would collect this information to calculate the CO make. That information was then passed onto Mr Reed and that was the extent of Allan's duties, to pass that information to Mr Reed.

At that point in time was there either a log, table or a

graph?-- I was not aware of a table or graph at that stage.

You were certainly involved in setting one up?-- After the 4 South level, yes.

You didn't get given any graph to work from, you had to work from first principles?-- That's correct, yes.

But prior to setting that up, do I understand that part of the system was the weekly readings?-- That is correct, weekly readings of extraction panels.

And in addition to that, monthly ventilation reports?-- That's correct, yes, monthly ventilation reports.

Now, one of the graphs that has been produced - and there may be a table, I am not sure - during this Inquiry is the one for 5 North?-- That is correct, yes.

CO make for 5 North. Can you tell me when that was done?-- The table that has been submitted to the Inquiry?

Let's start with the graph. There is a graph for 5 North?-- Could I see the exhibit, please?

I will just get you the number. I think it's part of Exhibit 21. Have you got Exhibit 21 there?-- I have, yes.

Now, if you look at the very last page you will see that's the comparative graph of all panels?-- That is correct, yes.

Now, that includes 512 to its sealed time?-- That is correct, yes.

That was obviously produced after the event?-- It was produced after the event. The inspectors asked for it, yes.

If you come back one page there is a - looks like a hand plotted graph for 5 North or the 5 North-east return, VS 14; see that?-- Yes.

Did you produce that document?-- No, I did not.

Do you know where that document came from?-- After - I had seen that document on two occasions. The first occasion was on the 22nd.

Who produced it then?-- Mr Kerr produced that.

And when else did you see it?-- And then after the incident when we were looking for information around the offices, that was - Michael Squires actually had - he was TA, I think, previously to Allan. There was a filing system in the No 4's offices, and they were very old ventilation reports in that, and I think that's where he got this information from.

Well, I want you to come back up through the exhibit seven pages and I think that will be a CO make graph for 5 North?-- Yes.

Tell me, was that done as a graph before or after this explosion?-- It was done after the explosion.

At the request of the inspectors?-- No, I don't - I'm not sure if it was at the request of the inspectors. I think it was part of - I'm not 100 per cent sure, but it was part of analysing what had happened before, you know, once that information came to hand.

But that graph didn't exist in that form before the explosion?-- No, it did not, no.

And then two back - I am sorry, I am taking you the wrong way. Two over, that is further back into the document, should be the CO make graph 511 - two pages further in from where I just had you?-- I beg your pardon, yes. 511, yes.

What about that one, was that produced before or after the event?-- That was - that would have been produced before the event. That was the very first draft that we had drawn up. They differ slightly from the other logs; we just introduced a few more things.

A few modifications?-- Titles and things like that, yes.

The CO make graph 511 is the first complete demonstration of the computerised recording of Allan Morieson's system?-- That is correct, yes, and that was part of - the start of our QA system.

Let me take you to - if you can just go to the front of the document, please. The first page, I think you said earlier today, was certainly done after the event?-- That is correct, yes.

Likewise, the second page?-- No, the second page is the 401/402 panel.

I am sorry, the second page that I have is CO make 512, Friday 5 August to 7 August graph?-- Yes, sorry, that's the third page in mine, yes.

Is it?-- Yes.

That was produced after the event?-- That's correct, yes.

Now, what's your second page?-- The CO make 402/401 starting 5/11/93.

Table or graph?-- Table.

One page of that?-- Yes.

Then where is the second page?-- Just after.

Page number 4?-- Yes.

And that's followed by the 402/401 graph?-- That is correct,

yes.

Produced before the event?-- That is correct. That was produced before the event at the sealing of that panel.

And the table for 402/401?-- The same time, would have been produced at the same time as the sealing.

Now, 403 next follows, if I am lucky?-- That is correct, yes.

And what about it, before or after the event?-- That was before the event.

And the table too?-- And the table as well, yes.

Put that down now. You were asked some questions before also - I think this might have been yesterday - about perceptions of an incubation period; do you recall that?-- Yes.

And you were telling Mr Clair that you had discussed incubation periods with Allan Morieson?-- That is correct, yes.

Did you discuss incubation periods with others, and I have in mind Mr Reed?-- Yeah, it was brought up in conversation, not a specific topic that was discussed - I can't recall any actual instances of when it was discussed and who and why, but it was brought up.

And it was Allan Morieson who told you 6 to 12 months?-- Yes, it was.

As a life span. Did he tell you where he got the six months from?-- The six months he said came from the Kianga report.

And the 12?-- I think that was just from local experience.

Experience in 401/402?-- Must have been, I don't know; he just said between 6 and 12. I wouldn't have questioned the 12 because of 401/402, but I don't know when exactly we discussed that as a topic, you know.

Well, 401/402, as we know, took about 11 months on extraction?-- That is correct, yes.

That was the one, I think, also that involved - no, it's all right. So, actual experience gave you one parameter and Mr Morieson said he had drawn the other, or at least one of them from the Kianga report?-- From the Kianga report, yes.

Did you feel in a position where you could actually challenge the factual basis or validity of what he was saying?-- No, I didn't.

Were there discussions of which you were aware with or between other people which lent force to the existence of an incubation period?-- No, there weren't any discussions as such.

I don't mean with that as a topic, but did people talk about it?-- Not generally, no, no.

What was your own view about the incubation period, not in terms of the length of time, but perhaps the basis for it?-- The basis?

Yes. Did you turn your mind to whether it had any bases, or if it did, what was it?-- I am not in the position - I wasn't in a position to criticise or have any opinion about it.

Can I just ask you about something else? The system for ventilation in 512 which we have discussed earlier, that is, flanking returns on development, bleeder return and main return on extraction and stoppings across the most inbye cross-cut?-- That is correct.

To direct air around. You said that was something that had been done in Moura - was the usual practice in Moura No 2?-- That is the extent of having to develop and extract a panel, yes.

Were those procedures followed in 4 South B?-- 4 South B, to my understanding, was the first area that the Inspectorate asked Mr Reed to re-submit his Part 60 to ventilate the goaf. When you look at the plans that - in the sequence of which plans - which panels were extracted, that is the only panel that - well, that 4 South B was one of the first panels that actually had a permanent top return.

And the Inspectorate themselves required ventilation in a particular form?-- Yes, I was told that by Phil Reed, that he had to re-submit the Part 60.

And it was a re-submission on the ventilation question?-- On the ventilation question, and there might have been a few other issues, but the ventilation question was one.

Certainly in your experience then, from what you understand, there have been occasions where the Inspectorate have made requirements to change ventilation even at the Part 60 stage?-- Well, I am led to believe that. I haven't actually seen any documentation.

Now, you were answering Mr Clair yesterday when you referred to the new overcasts that were put in at the 6 South/1 North-west junction and the impact that it had on air. Do you recall those questions and what you were saying about that?-- The introduction of them or -----

Well, the impact that they had?-- The impact that they had, yes.

Having been introduced, they had an effect?-- They did, yes.

Which I think you sort of encapsulated by saying you could drill 510 and mine 512 at the same time?-- That is correct,

yes.

Whereas prior to their introduction you probably couldn't have done that?-- That is correct. Prior to the commissioning of the 6 South overcasts, if we could call them that, the fan pressure was running at approximately - about 1.5 kPa. On the fan curve that reduced the quantity of air that was running through the panel, and that was an assessment that Andrew Selff had made. In February, February/March, the fan pressure dropped from the 1.5 to between 1 and 1.1 kilopascals and on the fan curve there was a - an approximate increase of about 22 cubic metres a second through the entire mine.

Now, when that came on line in February '94, there were increased air quantities. Was something also done with the 5 South gas range holes?-- That is correct. We - one of the methods we determined about - determined - to determine whether an area was - we had the ability to mine a degassed area was to physically take every gas hole off line, off the gas range line and bleed them naturally into the mine ventilation.

What would that tell you?-- That would give us an indication that we could cope with the gas production of the nine holes that were drilled in 5 South, and we did that over a period of time to assess whether that was possible or not.

Did it work?-- Yes, it did work.

Can I go back to 512 for a moment, and I want you to turn your mind now to the operational side of 512 - the day-to-day operational side of developing and extracting. You were involved in the planning side, but once the part 60 had been approved, what, if any, role did you have in relation to the operation of 512?-- Very little really. It really was an undermanager's job from thereon in to run according to the plan. I didn't have any say with regards day-to-day - to the day-to-day side of mining coal.

When you say that, are you talking generally about the mine, or 512 in particular?-- Generally coal mining areas; say, like the 512 or the 5 South where they were producing coal. I might have more input into areas - outbye areas where outbye work was being conducted or panels were being set up to mine coal, but really the undermanagers took on that role once the panel was up and running. If there were problems, then - or things that they wanted me to look at - specific things - then I would be given a task to do in the panel. But other than that, I wouldn't be on the day-to-day running of the-----

In terms of the assessment of day-to-day - what was happening in the panel and what impact it had, if any, what role did you have in relation to that as, say, compared to the undermanagers and deputies and managers and so on?-- I did not have very much to do in that regard.

Notwithstanding that you didn't have much to do with it, you did have those occasions when you did go down to take readings and so forth?-- Yes, there were tasks to do, yes.

You were down there on occasions when miner drivers were working at the face?-- Yes, I was.

And in terms of the quantity of air that was flowing, can you make some comment about what you observed from time to time about the miner drivers?-- On one particular incident or two particular incidents I can remember, when the miner was on the - or towards the down dip from the belt and the bag stoppings were erected across the mining face, one of the operators, Greg Edelman, used to wear a welding jacket coat - you know, the leather sort of half-waisted welding coat - and that basically was to keep him warm because of the quantity of air that was actually flowing over the top of the miner to remove the dust. They physically - he wore a jacket on that one particular day I went down.

You mentioned there were a couple of occasions-----?-- There was another occasion where people would wear a sloppy-joe.

While working at the face?-- With the remote control hanging around their neck.

Yes, that's what I mean, not working with the miner?-- Yes.

In relation to expectations of CO make in 512 you were asked questions yesterday about your discussion with Allan Morieson

in relation to that. Do you recall those discussions?-- Yes.

How did those discussions come about? How did you come to be talking to Allan Morieson about that?-- Allan was the most pertinent person to talk to with regards to mine ventilation in the mine and expected possible CO makes. I mean, Allan is a very close friend of mine, and we would talk about many things - not just at work, but at home and on the weekends. It was a discussion that we had - I don't know when - most probably just before or just after extraction started - about the possible make that we could get with the type of mining system that we were going to introduce.

And was it a joint decision of yours to do this data collation and the commencement of data collation for a background make? Was it his idea or your idea?-- It was a thing - it was something that I thought would be worthwhile - I mean, to understand what was actually happening in every panel before we started extracting and then be able to collate some information to look at later on.

In relation to that, you said that you had taken as background make 2 lpm?-- That is correct, yes.

That was a general figure, obviously?-- That was a general figure, yes.

Did you go to some records in order to verify it, or did you simply each have an awareness of what general make was?-- Well, Allan from his monthly ventilation reports - I mean, there were figures there that varied from between 1 to 3 litres a week and we were around the - at that stage, the 1.4, 1.6.

So, you adopted an average?-- We adopted an average. It was roughly 2.

Well, not intended to have scientific precision?-- No, there was no scientific approach to it all, other than personal experience at No 2 underground.

In relation to that - that particular topic - personal experience - how did you compare to Allan Morieson in the amount of-----?-- Obviously I was fairly inexperienced in comparison to Allan.

He had had a lot of years there?-- Yeah, he had been involved in the sealing of the 5 North and such incidents.

Was it he who proffered the view that a litre per minute per week might be an anticipated weekly rate?-- An anticipated weekly rate, yes.

And was there any discussion then about where that would all end up - at what figure it might end up?-- Well, he asked me the question how long would we be in the panel, and my timing with regards scheduling indicated that we would be there for about a three month period; we shouldn't be there any longer. The type of mining with the smaller pillars on the way in and

then only taking a row, leaving a row allowed us to come out at a much faster rate than we had experienced in other panels.

Did the two of you or either of you do some calculation of what 12 weeks times 1 plus your base of 2 was going to lead you to?-- Yes, we did, and it came out to 14.

14?-- Yes.

Again, no enormous scientific analysis about the basis of it?-- No, no scientific analysis as such.

But an experience-based general assessment of where the panel might end up?-- That is correct.

Your Worship, I'm not going to a new point, but I do notice the time, and bearing in mind that directive the other day, I don't wish to over-step the mark. I'm happy to keep going, or I'm happy to stop.

WARDEN: How much longer are you going to be this afternoon?

MR MORRISON: A little while yet. Not five minutes.

WARDEN: We will have a short break.

THE COURT ADJOURNED AT 3.13 P.M.

THE COURT RESUMED AT 3.27 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MORRISON: Mr Abrahamse, we were discussing the conversation between you and Mr Morieson about anticipating CO make and we were mentioning the fact that there is no scientific basis; it was based largely on Mr Morieson's experience?-- That is correct, yes.

You extrapolated them to a then-predicted figure of 14 litres towards the end of the panel?-- That is correct, yes.

At that point you were aware of the little paragraph in Mackenzie-Wood's book - Strang and Mackenzie, I should say - that talks about the two figures, 10 and 20-----

MR MARTIN: My learned friend, as I understand it, is in chief. Now, that's a blatant leading question and I object to it and questions of that nature - that he was aware of the statement in Mr Mackenzie-Wood's book in that form. It is objectionable. It is blatant leading.

WARDEN: What do you wish to say?

MR MORRISON: There are a few things that can be said about it. Firstly - I will go through in no particular order, just as they appear. Firstly, we are not in a Court of law. That's been amply demonstrated and it is a fact under the Act; secondly, all parties have been allowed a considerable amount of latitude in the way they address and cross-examine witnesses, including those who belong to one side, even though one doesn't Act for them; thirdly, evidence was given either this morning or yesterday, I've got a feeling it was yesterday - I would have to refresh my memory from the transcript - that this was, in fact, the case, and Mr Clair had used it - I only put it to him because he said it, and I think Mr Clair agrees with that.

MR CLAIR: Yesterday afternoon, as I recall it, Your Worship, the witness did refer to that statement in the Strang and Mackenzie-Wood book, probably about mid-afternoon.

MR MORRISON: So, in the circumstances, I don't think it is leading, with respect, and I should be allowed to continue.

WARDEN: Yes, I will allow the question.

MR MORRISON: Mr Abrahamse, I was taking you to that conversation where you had worked out the 14 lpm and I was saying to you that you were at that stage aware of the paragraph in Strang and Mackenzie-Wood's book which mentioned the two figures of 10 and 20?-- That is correct, yes.

Now, as you understood that text and the way it had been taught to you, what was the significance of 10?-- The significance of 10 required investigation. The greater than 20 was cause for concern - major cause for concern.

Was it your understanding that at 10 you already had a problem, for instance?-- There was a - between 10 and 20 was a grey area. There is quite a large difference between the two. At 10 I would have thought, "Well, that was for - you know, for you to become aware - to become more cautious at that particular point."

Investigate?-- Investigate, yes.

Well, when you worked out 14 with Mr Morieson, was there any discussion then about the significance of 14 by comparison with the 10 and 20 that is mentioned in the Strang and Mackenzie-Wood text?-- Considering that we had a 2 in general background, we were taking that 10 to regard - as regarded in the extraction process of that panel, and that is where we came about the - to the 14 - understanding that, okay. You - the coal could give a background of a possible - a possible background of 2 and use that - the 2 plus the 10 to say, well, that at 12 you should be right but we would take - the schedule for that panel was to be completed in three months or 12 weeks, so we were in that area that needed to be watched, but we weren't overly concerned.

Now, you said yesterday that it is not just the figure - I think just in this instance, it is not just the CO make but the trend that matters as well?-- The trend, that's correct.

What did you understand about that from your teachings in Mines Rescue and otherwise?-- There was no effective teachings on what rate of rise to look for or to expect, but it was just - the only significant - the major significant part in - when looking at your CO make and your trend is if it took a spiral - or if it took a trend in the upward direction - a sharp turn upwards, then that was a sign of possible danger.

And is that what you understood from the teaching of Mr Kerr in so far as you got it at the Mines Rescue Brigade?-- At that stage, that was as brief - as I understood it, yes.

I am confining my question to your state of knowledge then, not now with everything else you have heard and experienced?-- That's correct, yes.

So far as you were aware, in accordance with your teachings, you would be looking for a sharp rise to signify there was some occurrence-----?-- Yes, something untoward is occurring underground.

And when you came to construct the graph that was the physical embodiment of the system Morieson was already using, it entailed the use of a weekly average of the CO?-- The CO make used the weekly average, yes.

Was that something that was already part of that system by Mr Morieson?-- That is correct, yes.

You didn't feel in a position to - or did you - in a position to question that?-- No, I wasn't in a position to question that, and I do not know where the origin of that was, but to my understanding those figures, the figures that would be taken at a vent station including the weekly average would be given to Mr Reed.

So it would not only be the graph or the - not only the average CO make, but the weekly average parts as well would be given to Mr Reed?-- As I am to believe, yes.

That's your understanding of the way it went?-- That's my understanding of the way it worked.

That at least it reflected in the logging of your system or you're documentation because not only is the make revealed there, but also the Drager parts as well as the average Maihak parts?-- That is correct, yes.

So one could make a comparison one to the other very easily?-- Well, - yes, you could make it easily, yes.

In terms of making such a comparison was there something that in your perception mattered as between the parts on the Maihak and the parts on the Drager?-- If they were consistent with - you would correlate the two, the parts on the Drager and the parts on the Maihak. If they were very similar that would give you an indication of a true CO make for that particular week.

Now, when Morieson compiled the weekly CO make graph that was done on your computer, as I understood you to say?-- We had one PC in that office, yes.

Would you physically do it or after a time did he physically do it?-- No, he would physically do it. The 510 - the 511 panel, when we set it up I would - I was in the process of showing him how to set the table up and then how to use Lotus. Allan actually purchased a PC himself towards the end of 1992 or beginning of 1993 to improve his skills with Lotus and on Word Perfect, so I was teaching him a bit of Lotus so he would be competent enough to do his monthly ventilation reports by himself and the CO make and anything else, rosters or whatever else he wanted to do using the PC.

Using the spread sheet functions?-- Using the spread sheet functions.

And he in fact did do graphs by himself on that machine in the sense -----?-- The CO makes, yes, he printed them out on a weekly basis himself.

You weren't required to enter data or print it out?-- No, I wasn't there all the time.

And from time to time did you discuss with him the

significance or otherwise of graphs that were produced?-- On some occasions I would, if I saw him. It was a very general thing if he saw me or if I saw him producing it. Like I said, for many weeks of the 512 I wasn't actually there, but if it came up in context we would - he would say something. If it didn't, we didn't, you know.

Now, you were on leave between 16 June and 11 July and during that time, as I understand your evidence, you got that phone call from Mr Schaus?-- No, sorry -----

Was it not during that time? Sorry, you called him?-- Yes.

You called him and in the conversation he mentioned the ventilation problem in 512?-- A ventilation problem taking one of the sequences uphill. We had discussed this - when we put the Part 60 together there was a fair bit of discussion whether we would try to take a sequence on an uphill or try to keep it on the downhill. The size of the compartment pillars made it difficult where your boot was located for your shuttle cars to reach certain areas because they were so large. So we had to compensate where we would locate the boot, the boot end, and then ascertain whether we would take a sequence on the uphill or downhill side. It just was very dependent on our shuttle car wheeling reach and that was the point he made. He said that they had taken a sequence on the uphill and they had rectified the situation.

Now, when you say taking a sequence on the uphill are you talking about the direction in which the miner is facing as it takes bottoms?-- That is correct, yes.

And taking it on the uphill was only one part of the extraction sequence of this panel?-- Yes, it was only on the bottom return, that is correct.

You didn't understand Mr Schaus to be talking about the difficulty that we have heard described by Mr McCamley and others on 17 June?-- No, I was not aware of that. I only became aware of the methane layering up the No 2 heading on the Friday before the incident when, after I had taken David Hill underground we had gone down towards the bottom of the 512 Panel in No 1 heading and there were a few stoppings that had brattice over - on the inside of the panel, and I thought it was a little bit - and then there were some down the bottom that had holes in them. I asked - with that in mind on the Friday morning - I don't know whether it was start of shift or towards our production meeting I had asked Mr Schaus about the holes in the stoppings and then he just said, yes, there was a problem with layering in the No 2 heading and they used that to get rid of the gases that had built up in the triangle down the bottom and at that stage we had finished, we had finished extraction of the 512 Panel.

Now, in that conversation with Mr Schaus, that's on Friday the 5th in the morning, did Mr Schaus say anything to you, and if so what, about smells or hazes or anything else?-- No, there was nothing about smells or hazes, just the fact that there was gas coming up the No 2 heading.

Referring to that previous incident?-- And that's when it clicked that when we did discuss on the phone - I had rung him up about some information about our justifications, and I just had remembered something when I was on holiday.

Mr Morieson got a high CO make, that's been directed to your attention, on 11 - 10 June 1994. Perhaps you better - have you got Exhibit 21 with you or the table from that, it doesn't matter which?-- 21, yeah.

I would like to direct your attention to that again if I may. It's the tabular form of data for CO make 512, first page, 10 June. Do you have that?-- Yes, I have.

You will see that the figures leading up to that for the few weeks before that are CO makes of five, seven and just under seven?-- Yes.

And then on 10 June it jumps to 11.43. Do you see that?-- Yes, I do.

Can you recall discussing that reading with Allan Morieson about that time?-- No, I can't, no.

Did he raise it with you about that time?-- No, he didn't.

What about the next reading which is the one signified for the next day, 11 June? What about that one, 11.61?-- No, he didn't actually.

Can you recall that being raised with you by anyone else?-- Not that I can recall.

Now, do you know whether something was done with the goaf on 10 June or 11 June?-- Previous to the explosion?

You tell me. Do you know if anything was done with the goaf?-- No, not that I was aware at the time.

At the time?-- There was nothing that I -----

But since you understand that something was done?-- Yes.

What was that?-- That in area there were holes constructed in that area and the return gas, methane that was coming up No 2 heading was allowed to escape, I think, via No 8 are 9 cut-through.

That's the incident that McCamley talked about, is it? Is that the one you are talking about?-- When Allan and Mark were underground, yes.

That's 17 June?-- I assume so, yes.

Have you learned something that was done with the goaf on 11 June which coincides with these two high readings of 11 litres roughly?-- At the time, no, I didn't.

Mr Morieson gave evidence that the goaf was flushed on 10 June and that was why the high readings were obtained. Did he ever discuss that with you?-- No, he did not discuss that with me, no.

Either at the time or afterwards?-- After the event when we were going through the information he had said that at different stages - that was the long weekend that he watched the CO make, that he had closed one of the returns, the bottom return, down slightly - or I think the 510 top return had been closed to allow more air into the panel, but that was after the event.

It's certainly something he said before he gave evidence at this Inquiry?-- Before he gave evidence to the Inquiry, but after the event that's correct, yes.

Then the figure that you were directed to was the next one which is 16 June, 7.32. Now, can I ask you to note the velocity reading of that one as you did earlier, 1.4 versus the previous one which was 1.6 roughly?-- 1.59, yes.

And the following one which was 1.6. Does that have any impact then on the figure or the comment you can make about the 7.32?-- A reduced volume obviously against a CO parts per million would reduce the CO make.

So reduced volume will impact on the CO make figure itself?-- That is correct, yes.

Can we see something about whether that might be so for this set of figures, if we look at the CO ppm both Drager and Maihak and let's start with 10 June. They are each five and 4.5-- Yes.

Then the next day five and five?-- That is correct.

And then on the day of the low reading still up around five and 3.6 on the Maihak?-- On the Maihak, yes.

That's a weekly -----?-- That is correct, yes.

Five and 4.5?-- That is correct.

5.5 and 4.5. It doesn't seem to have been masking the CO parts, does it? If there was a flushing on the 16th you still got the normal level of parts; is that right?-- Yes, plus or minus one part comparing the two, yes.

If you had a big flushing out of the goaf in accordance with what Mr Clair put to you, would you expect to see lower parts?-- If there was a major flushing you would expect lower parts after the flushing had occurred, yes, but like was said, it could have the adverse effect too.

When one is looking at CO make for those sort of figures, the volume of air pushed through the panel matters, doesn't it?-- Beg your pardon?

The volume of air getting pushed through the panel matters, doesn't it?-- Matters?

Yes?-- Yes, it does.

Can I ask you to assume a few things if we go down 10 June, 11 June and 16 June, that - we will just deal with the top return, we don't need to deal with the bottom for the time being. 10 June, 38 cubic metres; 11 June, 35, just under then; 16 June, 31, a drop. Would that have an impact on the figures that you are looking at?-- The quantity of air running through the panel, yes, would -----

You would get a drop in the quantity. What would you expect to see?-- I would expect to see a rise as we did, a rise in the CO if you got a consistent drop.

In the parts?-- In the parts per million, yes. That again was evident in the one fan operation where we had a velocity of one and a rise of seven - a rise of one part to seven parts.

So it does have an impact on the way you treat the figures, doesn't it?-- That is correct, yes.

Whether velocity is down or parts are up and whether one reading is right or one reading is not?-- It has an effect, yes.

When you came back from your vacation, that was 11 July. You mentioned that your work had piled up and you really had to pay attention to it. Did that keep you out of the pit, as it were, for a short time?-- I actually went down the pit on that Monday with Michael Squires. There had been a fall on the miner while I was away and I wanted to have a look at the location of the fall and the type of the fall. So on that Monday I did make time to go underground with Michael.

And did you go to 512?-- I did, yes.

And what did you notice when you were down there, anything in particular?-- No, as I said, I went specifically to the bottom side of the panel to have a look at -the fall had pinned the miner.

So this is the bottom side at about 5 cross-cut; is that right? Perhaps you could just flick that one plan over and you can check the other?-- That is correct, 5 cross-cut, yes.

Did you notice anything at that stage yourself, smells, heats, hazes, things of that nature?-- No, not - no, I didn't identify anything.

Did anyone with you or in your presence mention anything like that?-- No, no, no-one mentioned anything like that. On that particular day they had completed mining towards the top end of cut-through 5 and the boys were physically cleaning up that bottom road, pushing the coal into the - pushing props and other rubbish into that goaf area to get ready to commence - the next sequence was to be conducted in that area. So I

climbed over the loose coal or mud and silt and props and whatever else was there, to peer from the bottom side of the panel towards - uphill towards the fall to get an idea of what was happening, but I didn't notice anything.

And a few days later at the end of that week Allan Morieson

went on leave, 15 July?-- That Friday, yes.

Now, did you talk to him before he went away about the readings he got for that day?-- No, I hadn't actually talked to him about the readings he had got on that day, no.

He didn't come to talk to you about them?-- Not the readings itself. He was - at that stage it was between 2 and 3, somewhere in that time. He had concern that he was going away for the - on holidays and that he hadn't had a chance to talk to the person that was going to take over his job. He just wanted to - you know, to tell them what he had done and where his stone dust sampling bags were located and -----

All of the mechanical things?-- The things that he - you know, when you go on holiday, if people don't do those jobs it just mounts up for you when you come back.

Did you offer to help him out in that respect?-- I did, yes.

How was that?-- I just said to him that I would make sure whoever was doing the job - if they brought the readings up to myself, I would then table them, plot the table and the graph out and get them to sign it and at least have that task completed.

So, the question of the CO make graph as a document was certainly raised between you and Allan Morieson that day, albeit in the context of you would make sure it was -----?-- Make sure I would produce it, yes.

And notwithstanding that that topic was in the air, Allan Morieson didn't say anything to you about any level of concern over the reading he got for 15 July?-- No, not that I can recall, no.

Now, he went on leave. On the Monday following - that is 18 July - did you discover that Steve Bryon would be doing Allan Morieson's job?-- That is correct, yes.

Now, did you have some discussions with Steve Bryon about what he would be doing in Allan Morieson's place?-- All I said to Steve was that - the fact that with regards the CO graph and the weekly CO make, that if he got the results I would table it for him and produce a graph for him to sign and distribute, and then also I just said to him I knew that Allan had the stone dust sample bags ready on his desk and they were already numbered, and I just identified a little cardboard box that Allan used to have his maps with his zones on, specific zones for collecting dust, and I just showed him where the maps were, and Steve said he knew about it, knew about the stone dusting, and he would get the CO make results to me on a weekly basis.

And did you then just let him go about that over the weeks that followed?-- That's correct, yes.

He would go and bring you results and you would table them?--

On the Friday, that's correct, yes.

Now, you didn't, from what I understand, tell him how to take readings or even where to take readings?-- No, I did not, no.

In terms of where to take readings, you were asked some questions yesterday about deputies taking their readings at VS 46?-- Yes.

Which we identified as being in the 510 top return between No 1 heading 512 and the regulator?-- That is what the plan indicates here, yes.

Now, in terms of where - we have heard also a monitor point was there?-- That is correct, yes.

In terms of the placement of a monitor point, where does that fit in, if it does at all, in relation to the planning for a panel, so far as your involvement was concerned?-- Just really making the note that there must be a monitoring point, or there should be a monitoring point in the panel. Specific location would really be - I wouldn't say a specific location because a cross-sectional area is required, and whoever was looking after that would require to obtain a cross-sectional area.

Who was looking after it? That was Allan Morieson?-- Yes, that's right, yes.

It would be left up to him to decide precisely where -----?-- It was left up to Allan, yes.

I will just ask you to remember something from yesterday. I think you said to Mr Clair that there was a piece of wood at the VS point with the letters "VS 46" written on it?-- Yes, there was a rectangular block of wood with the reflective lettering of "VS" and whatever number. Allan had gone right throughout the whole mine establishing those points. When I arrived in '92 there were markings on the rib and he had progressively upgraded that standard to mark them with wooden blocks and then nailed them into the coal ribs.

And the wooden block contained some further information, didn't it, about cross-sectional area?-- Some vent stations had a cross-sectional area figure on it, not all.

Can you remember whether VS 46 did or not?-- I cannot remember, no.

Now, if we can come to 22 July then, the day of the 8 parts reading from Mouse. You mentioned that he and Rose came into your office around lunchtime with some information and Mouse said something to the effect of - I think, "Here's something.", or, "We've got something that will interest you."?-- That's correct, yes.

He wasn't more clear about what he was talking about, was he?-- No, not as he walked in the door.

Did he make it more clear what he was talking about?-- It became more clear when he read out the parts per million to me.

And did you enter the figures as he read them out?-- That is correct, yes.

Now, in terms of the figures that you needed to enter into your normal line of data on those tables, did you need to go and get any of that yourself or did Steve Bryon have it all with him?-- No, he had all that information with him.

Including the Unor average?-- Including the Unor average.

Now, you mentioned that you entered the three velocities on a simple formula of three additions divided by three and that was when it was - the average was demonstrably wrong because of the third reading?-- That is correct, yes.

Now, at that point you had already entered the 8?-- That is correct, yes.

Had there been any discussion of the fact that 8 parts was found or what it meant?-- No, we were simply entering the data into the table.

When you finally got the corrected anemometer reading in, that gave you a make automatically?-- That is correct, yes.

Some formula in the cells in the latest software?-- Initially it would have given us a make on the 5.7. The formula in the last column in the total CO litres per minute would use - would have used the CO Maihak reading and that was a simple - once I had corrected the velocity, all I did was we used the worst case scenario of the 8 parts because that was a significant jump to - in that formula and used the 8 parts to calculate that 18.98 lpm.

Well, if you have got Exhibit 21 with you still, can you look at the entries for those dates? The first is the 18.98 which is calculated on the 8 parts?-- That is correct, yes.

It's calculated on 8 but not the Unor average?-- That is correct, yes.

Now, before you overwrote it with the 8, obviously the machine gave you a CO make reading based on the 5.7?-- That is correct, yes.

Now, we can see, I think, roughly what that might have been if we look down for the next entry for the 22nd which is in fact calculated on 5.7 but at a velocity reading 0.01 higher, 13.7, isn't it?-- That is correct, yes.

So, until you overwrote it with the 8, the machine would have been giving you a CO make reading of about 13.7, perhaps a little lower in fact?-- Yes, it would have, yes.

So, the 18 comes from a deliberate decision by you to utilise the Drager parts rather than the Maihak average?-- That is correct, yes. That was a note that I put on the bottom of the sheet that we gave to Mr Barraclough, mentioning the two.

Now, at that point when the machine actually gave you a CO make of over 18, did Bryon and/or Rose say anything about that?-- Well, that instinctively was a point of concern, reaching a level of 19. I mean, nothing much had to be said. It was, "Well, what are we going to do with this?", you know, "Something must be down there."

Was there any discussion about it? Did Bryon say anything like, "Wow, that's high.", or anything else?-- We all knew that was high, yes.

And you printed off the graph, which I think you have identified as being in Exhibit 110. If you haven't already got that, you better have that back. I think you have identified it as being the second page; is that right?-- That is correct, yes.

This is the document that was taken to Joe Barraclough?-- That is correct, yes.

Who was Acting Manager at the time?-- That is correct, yes.

And is that writing yours on the bottom right?-- On the bottom right-hand side, yes.

"Drager 8 parts, Maihak 5.7, used Drager readings for litre per minute CO make." There is some writing on the note that is chopped off on mine. Is that simply your initials?-- It's simply my initials, "JFA".

Under the letters "A J Morieson" there is some writing that's been chopped off on my copy. What is that?-- That is Steve Bryon's signature.

Now, when you went to see Barraclough did you take more than that, more than that page?-- Yes, I got a copy of the log for the two readings - for the one reading -----

Is that a copy of - or part of that page that we see in Exhibit 21?-- That is correct, yes. It wouldn't have been in that exact - that format because I would not have had Friday a.m. at that stage. It was just the date, 22/7/94.

Is the normal line of data as though it was a reading that was to be graphed?-- Yes, the 22/7 was the first line of data for page 2 of 512 CO make.

So, Bryon and Rose went with you?-- Joe was just next door, 10 steps away.

They went with you?-- Yes, they did, yes.

You end up, all three, in the manager's office, or with the manager?-- We were with the manager in the tea room, or

Allan Morieson's room they call it.

And in fact I don't think you were carrying the print-out?-- No, I had given the graph to Steve while I was printing out the second lot and he went over - we went over then to Joe. He had to put - Steve put his signature on the bottom of the graph.

When you got to speak to Mr Barraclough what was the topic of conversation, how did it commence? Did you speak or did Bryon speak?-- I really just handed him - I don't honestly know - I don't know the sequence of events in order, but all that was done was - in the general term was to show him the graph, that we had a sharp rise that produced this 18 or 19 litres a minute, and then he then examined the information that was put on the log, the 8 ppm Drager reading that was encountered - that Rose had encountered. We also then said something to the effect of the velocity - the third velocity reading was read incorrectly to me but we corrected it by looking back at the anemometer because it was on - because it was fixed, the last reading was still fixed on the anemometer in the box.

Did you in fact show Mr Barraclough the anemometer?-- I can't recall if we did or - at that stage Mr Rose had the anemometer. He might have, I don't know. I can't recall if he did or not.

And in the context of talking about the incorrect figure for velocity, did Mr Bryon make some comment?-- Some comment?

Yes, at your expense?-- At my expense, yes. He basically said he had seen me go white, you know.

Now, did you at that stage have - you had on the log the Unor average figure?-- That was already on the table, yes.

And was that discussed between the three of you and Mr Barraclough?-- Yes. Well, I don't know if it was discussed - I can't remember if it was discussed - if the Unor reading was discussed. I remember the parts - 8 ppm being looked at and said, "Well, that's what was obtained underground."

All right. Now, did Mr Barraclough ask to see something in relation to the Dragers?-- He asked to see the - he asked if Peter and Steve Bryon had actually brought the tube out with them, the Drager tube out with them, and they said that they hadn't, they had discarded it underground.

They no longer had the tube available to double check?-- No, they didn't, no.

Now, did someone suggest at about that time what might be done in relation to monitoring the panel?-- Joe specifically asked me if I could draw up a log that would be able to record these readings on a daily basis and I said I would do that for him. He also then discussed in general about maybe that we should look at sealing the bottom return and the No 4 heading, and he asked us about what - if that was a good or a bad idea.

And did Mr Barraclough indicate that he would speak to George Mason?-- He did. He wouldn't have been able to make a decision, he had to see Mr Mason and ask him whether that would be done or not.

Was there a discussion about whether the Multiwarn should be used?-- Yes, there was a question of asking whether we should have - should bring - should get the Multiwarn from the station and Joe said no, because that would introduce another piece of equipment that we didn't have any background readings on. We were using the Maihak and the 21/31.

He didn't want a third variable?-- He didn't want a third instrument in the ascertaining of parts per million.

Now, did Mr Barraclough go to the monitor room and check the Unor screen?-- At that stage I returned then to my - to the PC to get a log up and running and Joe and Peter Rose - I'm not sure about Peter Rose, but Joe and Steve Bryon went out of the room and I assume - I don't know - I assume they would have gone towards the Maihak to see what sort of readings they were actually getting underground.

In any event, you understood from Joe Barraclough that he was going to speak to George Mason?-- That's right.

You obviously knew who George Mason was. He was the undermanager in charge?-- That's correct, yes.

So, at this point in the proceedings, the reading had been reported to you by the deputy who took it?-- Yes.

You reported that reading to the manager of the mine - the acting manager of the mine at that time?-- Yes.

That acting manager was then going to discuss the matter with the undermanager in charge, as you understood it?-- Yes.

In terms of what you considered to be your responsibilities in terms of taking steps at that point, what was your perception then?-- I thought I had done - I mean, I didn't organise or didn't tell people or delegate people to specific tasks or jobs. I either obtained a task or-----

You mean that day, or generally?-- Well, it happens generally, but that particular day I was sent to get the log. I don't send people to do specific jobs, you know.

All right. You went off to do the log - the daily log?-- That is correct, yes.

And do we have a copy of that? Is that what you gave to Terry Atkinson - Exhibit 94, it might be?-- That was Exhibit 93 - that's what I gave-----

Which one have you got that's marked 93? The graph or the log?-- The graph is 93.

Have you got Exhibit 94?-- I beg your pardon, I do.

You do?-- Yes.

Is that the daily log?-- That is the daily log, yes.

So, absent all the writing, that is all the handwriting, and the figures for the 23rd - absent all the handwriting, that was the document produced by you?-- Yeah. The handwriting that I would have given Mr Atkinson that evening was the writing at the top of the page, the CO parts per million with Drager, and the other one with Unor, the a.m. and the p.m. and the total CO litres per minute, and the Drager reading checked

p.m. That's all that would have been on that graph other than the title.

The writing at the top you are talking about is the formula?-- That is correct, yes.

Now, did you at the same time produce Exhibit 93 in its then form; that is to say, the graph?-- That's correct, yes.

Did you draw the line up to the question mark?-- That is correct, yes.

At that stage did you - having done those two tasks, did you then do anything else yourself about checking the figures or doing anything about them, or did you rely on the other one?-- When? What time-frame are we talking?

You have gone back to your room and organised the log and the graph as Mr Barraclough had asked you?-- This is after lunch on the Friday?

Did you then do anything else yourself about checking figures or parts or anything else?-- Sorry, I beg your pardon, I got your line of questioning before. The Exhibit 93 was done after we returned in the late evening; is that correct?

Well, you have got to tell me?-- Yes, that was done afterwards.

So, when you went and did the log as Mr Barraclough asked you, it was just Exhibit 94?-- Yes, but it didn't have the - when I saw Mr Barraclough, or when I went to see Mr Mason that afternoon, that second reading wasn't in there.

Yes, I accept that?-- Okay.

Sorry, I probably didn't make myself clear. I'm talking fast again. Absent the handwriting on the second reading for the 22nd, that's the log?-- I beg your pardon, that's correct, sorry.

93 didn't get produced as a graph, whether with the question mark or without, or with the readings for the 22nd - the second reading for the 22nd and 23rd until later in the day?-- Yes, that is correct.

Now, after you had produced the log, Exhibit 94, did you take any steps yourself to go around checking figures, parts, readings and so forth?-- No, I didn't, no.

Did you rely upon whatever steps Mr Barraclough was going to take?-- That is correct, yes.

You had no reason to think he wasn't going to take steps?-- No, I didn't. I thought that's what was going to happen.

At that stage - you say you effectively discharged your duty and reported it to senior personnel on the site - Mr Barraclough and him to Mason?-- That's correct, yes, and I

was just waiting for someone to come back to me with results, yes.

You went later that afternoon to George Mason's office and saw him talking to Kerr?-- That is correct, yes.

Now, by that time had you printed out a second document apart from Exhibit 94, the log?-- No, I had not.

Only the log?-- Oh, the log and the - yeah, and then the graph that I had given Joe earlier that-----

The graph from Exhibit 110?-- Yes.

Was given to Mr Barraclough?-- Yes.

As I remember what you said, you didn't disturb Mason and Kerr because they were talking, but you came back about 4 o'clock?-- That is correct, yes.

And you then had a discussion between the three of you about the high reading for CO?-- The - yeah, the CO make for that morning, yes, we had - well, that's - we had made 19 lpm with Mr Rose's and Mr Bryon's reading of 8 parts.

Now, was any view expressed by Kerr at that point about the significance of the litres reading, or the significance of the parts reading?-- He didn't - I can't recall if he had said anything to me at that stage. The only thing I can recall is asking about the - which grade tubes we were using, but he did on his return produce the 5 North Vent Station 14 graph and just basically pointed to the very sharp rise in the CO make that had been experienced at that vent station.

Now, he went off to get some tubes from the Mines Rescue station?-- That is correct, yes.

He didn't bring back a Multiwarn with him, did he?-- No, he did not.

He brought back with him the 5 North VS 14 graph. What did he say about that?-- He didn't say much. He basically pointed to the very sharp rise. I mean, I understood what that meant.

He wasn't pointing to the left-hand side of the graph, he was pointing to the right-hand side?-- Yes, he pointed to the right - the sharp rise.

Did he actually say anything about it himself?-- I can't remember if he did or not. I just remember him pointing that out to me.

All right. Now, at that point - that is when he has come back with that graph - you knew already then that you were going to go down with he and Atkinson?-- I had asked - yes, in between Dave coming back, I had asked Terry if he would come down with us. George had asked me to - if I would mind going down that afternoon to verify that 8 parts.

By that time had Mr Barraclough left?-- He had, yes.

He lived in Kingaroy?-- That is correct, yes.

Did he usually go home at about that hour on a Friday to get home?-- Yes. Well, he had a long drive, yes.

Mason was still there?-- That is correct, yes.

When you went down, you went down - the three of you - that is, yourself, Kerr and Atkinson - and was there a miner who drove you down?-- There was a transport driver, yes.

And did that driver wait for you down in the panel?-- Yes, he did.

Can you remember who it was?-- No, I can't, sorry.

Before going down, were there some comparative graphs around of other panels?-- Not that I was aware of, no.

Not while you were there?-- Not that I'm aware of.

You said, I think yesterday or today, that when you were down there you did the anemometer readings and Dave Kerr did the Drager tube readings?-- That is correct, yes.

And when he took the readings, did you look at the tubes yourself?-- Yes, when you do a reading, it is just general or good mining practice to pass the tube to somebody else.

So that they can-----?-- So that they can see without you saying anything, and then saying, "This is the reading that we got.", yes.

Was that the practice that followed that day?-- That is what happened that day, yes.

And when you got down there, before you took the first readings, did you go to what you remembered to be the vent station inbye the prep sale?-- I went inbye the prep seal, that is correct.

Was there some marking on the wall there near the rib?-- Yes, there is an "M" marked on the wall.

And the first readings were just inbye that point, or at that point?-- They were at the location where the "M" was - the Drager tube readings were taken slightly outbye of where the "M" was on the wall, and I took the anemometer readings.

At the "M"?-- At the "M", that's correct.

And you then went further inbye some number of pillars, and there were further readings taken there?-- That is correct, yes.

And those readings were the same as the first set of readings?-- They were between five and six parts, that is

correct.

And was the same procedure followed? Readings taken by Kerr, show you the tube, and then each mentioned the result that you considered it showed?-- All the tubes that we took were between that 5 and 6 parts, yes.

Was it on the way down to the second reading site - that is, the inbye site - when you talked to Kerr about should you be smelling something?-- On the traverse in, yes, that's correct.

Was any more said by you or he on the topic of smells or anything else?-- No, I just asked him, "Am I supposed to be smelling anything. Tell me if I'm supposed to be smelling anything, Dave."

And he said-----?-- He said, "Can't smell a thing."

"Can't smell a thing."?-- And we just generally talked - we just generally said - I don't remember the exact conversation, but to the - in respect of saying, "Oh, it's good, you've got to check these. These are things you have got to do. You have got to check readings like this. If you get a concern, it's got to be checked."

Who was saying that? Kerr was-----?-- Between David and myself.

And did he at any stage suggest that you actually look further or do more or do something different?-- No, no, we didn't.

And when you finished with those readings, did you then move back through the door and into No 2 heading?-- We walked outbye again past No 1 heading, past the seal to the door, yes, that's correct.

And then down to where Reece Robertson was?-- That's correct, yes.

Was he at the crib table or at the face?-- He was at the face.

Were they cutting?-- They were cutting, yes.

You had some conversation with him at that point?-- Yes, we - we generally said - what we said - we were down the return, which is notifying him really that we were in his district, and just said that we were coming to check an 8 parts that had been previously obtained in the morning, and just verifying that. That wasn't the exact conversation. That was the general conversation.

Was the litre figure for the make mentioned to Reece?-- No, it was not. Not that I can remember.

The 8 parts was?-- The 8 parts was.

Did he express any surprise at the 8?-- No, he didn't. He

just confirmed the 5 to 6 parts that we had registered coming out of the top return.

And did he say anything at that point, given that you had just raised with him a high reading of 8 parts? Did he say anything about physical features of the panel, smells or anything else that he got?-- No, he didn't. Not that I'm aware of.

Now, you remained at the face for a period of time, I think?-- Yes, Dave and I stopped at the face. Terry had the opportunity to conduct his statutory responsibilities around the section and then we waited for Terry to complete that.

In total, I think you said yesterday about an hour had gone by by the time you got to the surface from when you had taken the readings?-- Yes, roughly an hour. There would have been about 15 minutes walking up the return, then five to the face - you know, by the time Terry had done his inspection - then 10 to 15 drive up. Roughly an hour, yes.

Now, when you got to the surface, I understand what you said - Kerr went off to speak to Mason?-- I think at that stage George was in the undermanagers' room. I went in and took my light off and then went into the undermanagers' room to the monitor room to check what we had - where we had just been, just to see what the readings were.

And the Unor system confirmed what you had got?-- Yeah, it was between 5 and 6 parts, yes.

Now, was there discussion between you and Kerr on the way out of the pit, or was it at the top of the pit about what had caused the high reading and the result of what you had found?-- No, there wasn't. Underground we just came to the consensus that something must have happened underground to obtain a wrong - an incorrect reading. Nothing was specifically said, no.

Was there also consensus that everything was normal?-- Well, in - to me it was. I assumed - well, the fact that there was - that I had not seen an 8 parts on the Unor while waiting for Dave and the parts that we had registered that afternoon - late on that afternoon - was in consensus with the Unor at that stage for the afternoon.

You produced Exhibit 93 - that's the graph which was what you were going to give to Mr Atkinson?-- That is correct, yes.

And you have told us about how you put on the question mark and the corrected reading for the 22nd?-- That is correct, yes.

But it is the case, isn't it, that the high reading remained on the log - Exhibit 94?-- That is correct, yes.

And it remained on the general log for CO make?-- On the table log, yes.

On the table, sorry?-- That's correct, yes.

You certainly weren't trying to hide it?-- No, I was not.

That reading had been conveyed to the acting manager, the undermanager in charge, the superintendent of the Mines Rescue station, two deputies, probably a third with John Blyton?-- Sorry, I beg your pardon?

The information as to the high reading had been conveyed to the acting manager of the mine?-- That's correct.

The undermanager in charge?-- Yes.

Superintendent of the Mines Rescue station?-- Yes.

At least two deputies - that's Bryon and Rose?-- Yes.

And probably a third with John Blyton?-- Yes, a possibility. I found out after that John - after the incident that John had rung the - had rung David earlier on after Peter and Steve had come up with the 8 parts.

Well, we know from Mr Kerr that that's the case, too?-- Right.

Now, you mentioned in relation to Exhibit 93 that that was done for Atkinson's benefit for the weekend, he being undermanager on shift?-- That is correct, yes.

Now, when you gave it to him did you tell him what he was supposed to do with it, and now I'm talking about Exhibit 93?-- Yes, I had. I asked him to - over the weekend if he obtained any sharp changes like the line that was drawn on there, to contact somebody and the log that I gave him gave him the formula to calculate the CO make, and I indicated that there was a calculator in the end office that he could use to calculate that.

In so far as you talked to him it was what he was supposed to do over the weekend?-- Over the weekend, yes, that's correct.

Exhibit 94 was provided to him for the purpose of recording results on a log?-- That is correct, yes.

And in so far as you discussed Exhibit 94 with him was that also in the context of what he had to do over the weekend?-- That is correct, yes.

Now, when you were back on the surface after having been done with Kerr did you talk to George Mason?-- I would have - after I checked the Unor I went to the computer to draw up the table or the afternoon p.m. reading. Once I had produced that I then went and showed George that the litres were - well, that the CO was the same as the Maihak and that our litres were at 13.7 and then proceeded to have a shower.

Now, the next time you saw Exhibit 94 was on the following Monday?-- That is correct.

And at that point the entries only went to the Monday and maybe not both lines?-- Not both lines.

Do you think you wrote in line 10?-- Yes, I think I wrote in line 10 only for the fact that I know that the writing of "one fan operation" is definitely my handwriting and the seven parts for the CO ppm and CO Maihak look very similar to my sevens with a little tail on the end and that's evident in the -----

The sevens look familiar; what about the rest of the figures? Does it look like the rest of your writing?-- Yes, from that it looks like the rest of my writing.

What about the line above it?-- No, that's not my writing.

The line below it?-- No.

The line below that again we know is Steve Byron's, or largely Steve Byron's. Now, on the Monday you mention that that was in the blue folder on the undermanager's desk?-- That is correct.

And you looked at the graph and plotted the figure for Saturday?-- And plotted the figure for Saturday, that's correct.

Now, that's the second occasion on which the general graph CO make 512 has consecutive days plotted. One was 10 and 11

June, the other one was 22, 23 July. Now, you've mentioned, I think, in relation to that there was something to do with the accountability of the way Allan Morieson perceived his accountability?-- That's correct, yes.

Do I understand correctly what you are talking about is simply to record that something had been done?-- To record something had officially been done, yes, and that he had it as a record, yes.

We have a record of the check that was made?-- That's correct, yes.

Absent that or some other record we wouldn't have a record of it?-- That's correct.

Is that the reason you did the Saturday the 23rd or was there some other reason?-- No, that - sorry?

There was just some chatter to my left. No need to pay any attention to it?-- Could you repeat that question?

Was the reason you did the 23rd entry simply because of what Allan Morieson had said about putting in a record -----?-- Simply to keep his system intact.

No other significance than that?-- No, no. No other significance, no.

In your own view, when you saw on the Monday Exhibit 93, and that is to say what Atkinson had logged over the weekend, what was your assessment of the CO make and its trend at that time?-- It did two things, it affirmed that what we did on Friday, the decision that we made on Friday afternoon was the correct one, that the -----

What's that, the decision to check or the decision as to what you found?-- No, the decision as to what we found, the fact that the 8 ppm could have been - were incorrect, they weren't found again, and then secondly that we had - the 15th was obviously a peak and that we still had a general trend on the - a general trend on the up for that panel.

The figures that were logged over the weekend were all around the 13 and a halves, the 13s, in that area?-- That's correct, yes.

Still under the 14 predicted level that you and Mr Morieson had discussed?-- Yes, it was.

Did you discuss with anyone else such as Mason, Barraclough, anyone else, the significance of what had been discovered over the weekend?-- Over this particular log?

Yes?-- No, I had not discussed it with anybody.

Now, on that Monday did you also have a discussion with Mouse about his reading on Friday?-- It wasn't a discussion, it was just - when I walked in to physically put the information on

one of the weekends into the log on the Saturday I just said to him that we had done the reading on Friday afternoon. We didn't - couldn't find eight parts, we only got between five and six. I had a bit of a dig at him, you know, asked him what he was doing or what the go was, you know, and he didn't say anything. Just a bit of general digging.

Now, you, I think, said today that you weren't aware of Mr Mason's note about taking shift readings?-- No, I was not, no.

And the balance of that week you were absent?-- That is correct, yes.

When you left on the Monday the log, Exhibit 94, and the graph, Exhibit 93, where were they? Were they in the blue folder?-- They were in the blue folder which I had returned to the undermanager's desk early part of the morning.

Now, you were asked some questions by Mr Clair earlier today about Exhibit 94 and 93 and I just want to ask you about that. What he suggested to you was that the very existence of these documents - not their contents, I'll come to that in a second - the very existence of these documents is an embarrassment, is an embarrassing matter. Now is that the case?-- In the context that he said that they were vitally important to what was actually occurring underground and that we were checking, yes, I would say - but, I'd say they would be, yes.

Embarrassing or simply significant? I mean how did you understand him to be asking about embarrassing? What did you think he was meaning? What did you think he was -----?-- "Embarrassing" is a very suggestive word as if we were physically trying to hide something.

Is that the way you understood him to be directing your question? I will read it to you just in case you have forgotten it. "You would concede, wouldn't you, that the existence of these documents is an embarrassing matter." What did you understand him to be getting at there?-- Well, as if - my opinion at that time was he was saying that we were trying to hide something.

Is that the case?-- No. The operation - Mr Schaus had made, after the incident and while the inspectors were there, made quite emphatic notes to us to say that any information that we - that the Mines Department required were all at their disposal. Everything was opened up, everything that we could find. Anything that they wanted was there.

And for all you know the inspectors might have come across these and passed over them?-- I do not know. I can't comment on that.

No way of knowing one way or the other?-- No.

And Mr Clair went on and he kept using this word "embarrassing", and I'm interested to know how you understood the question that was being directed at you, in what context.

He said, "Embarrassing in a number of ways. One that it shows that concern existed about the CO make in 512 some two and a bit weeks before the explosion that's the first thing." Now, how did you understand him - what did you understand him to be meaning by that? Was he suggesting to you it was embarrassing to have the document show that you were concerned about a high CO make? Did you understand him to be saying that?-- That's the way that he implied it, but it wasn't the case otherwise it wouldn't have been tabled, but -----

Because this is the only document that some of that information appears on, is it? It's on the main log, the 18.98 is on the main log?-- That is correct, yes.

And always has been; isn't that right?-- And always has been that's correct, yes.

And if nothing else that's a document that's always been in the possession of the inspectors, isn't it?-- That is correct, yes.

Well, he went on and said something else and I'm just interested to know how you understood that line of questioning and what you understood to be the basis of it. Then he went on and said - this was his second context, "Embarrassing in the sense that a system was established in light of that concern to monitor the CO make closely.", and he stopped there. Do you understand him to be saying that it was embarrassing to have established a system to monitor? Is that the way you took it?-- No, that's not the -----

That's what the question says, but you understood him to mean that, did you?-- No, not the fact that we had a system established, but the fact that we hadn't continued with logging the system.

That's a fact as we know it?-- That is a fact, yes.

And of all of them, of all of them that you mention that's the last one that he mentioned.

WARDEN: That might be a convenient time.

MR MORRISON: I am going to pass to a different topic. I am happy to keep going.

WARDEN: No, that's a convenient time.

MR MORRISON: I don't mean that in a threatening way.

WARDEN: We will adjourn until tomorrow morning, 9.15, thank you.

THE COURT ADJOURNED AT 4.44 P.M. UNTIL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 15/02/95

..DAY 26

THE COURT RESUMED AT 9.15 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

WARDEN: Thank you, gentlemen, please be seated.
Mr Abrahamse, you are on your former oath that took the other day; you understand that?-- Yes.

You are still sworn, you are still bound. Thank you.

MR MORRISON: Mr Abrahamse, yesterday we were discussing, amongst other things, the occasion on 22 July when you went down the pit with Dave Kerr and Terry Atkinson, and we have discussed what occurred down there and your conversations also with Reece Robertson who was the section deputy?-- That's correct, yes.

Now, at some stage either on the way down or on the way out on that occasion did you make some comment to Mr Kerr about his presence on the inspection and how you viewed that?-- Yes, I just said to Dave - I think it was on the way out when we got to the surface - I just grabbed him on the leg and said, "Hey, listen, Dave, thanks for coming down." It just gave me a lot of confidence taking Dave down and gave us a bit of credibility for what we were doing underground on that afternoon, yes.

We were looking at Exhibit 96. Do you have the exhibit still with you?-- No, I don't.

Could of the witness have Exhibit 96 and 21? Make it 94 and 21. Going back to the Monday which was the 25th. Some entries had been put in Exhibit 94, that's the log, and some information from that was translated into Exhibit 21, the table, for the Saturday reading and we discussed that yesterday, the reasons why that was done?-- That is correct, yes.

Did I understand you correctly to say either yesterday or the day before that you didn't actually go to the deputies' reports to put those figures in?-- No, the Saturday's figures were off this sheet here.

Off Exhibit 94?-- Off 94, yes, that's correct.

Now, there was a change in the Maihak system on 27 July, as we know. Although the procedures and system were almost identical, there was a change in computer and transfer to a mouse system rather than just a touch screen?-- That is correct, yes.

When you came on 1 August to plot the 29 July figure, so that's the Monday following coming back to plot Steve Bryon's figure for the 29th?-- Yes.

Did you do anything by way of checking the weekly average figure from the Maihak?-- No, I didn't.

Have you checked that since?-- I have run a lot of information off the Maihak, yes, and would have checked that since, yes.

You have seen nothing that disturbed your - the veracity of that average reading?-- No, no.

On that Monday, that's 1 August when you were doing that work with Steve Bryon, did you go then to deputies' reports for your figures or did you get them from Steve Bryon?-- No, I obtained them from Steve Bryon.

And on 1 August, I think I am correct in remembering what you said either yesterday or the day before, you actually generated the graph for the 29th for Steve to sign?-- On the 1st, yes.

That's on the Monday?-- On the Monday, yes.

You had been away all of the rest of - Tuesday through to the Friday of the last week?-- That is correct, yes.

Now, on Exhibit 94 you referred yesterday to that notation of your own in the right-hand column, "one fan operation"?-- That is correct, yes.

Is the figure "9.2" yours?-- Yes, it is, yes.

Now, that was a very low velocity on that occasion?-- That's correct, one metre a second, yes.

You said yesterday that the drop in velocity would produce the rise in CO parts which you see there?-- You would expect that, yes.

Now, there is material which shows that the fan was down between 1.26 p.m. and 8 p.m. that day. Is that time period of the fan being down consistent with what you see in that line on the data?-- Yes, it's a fair - it's a good period of time on our down day for that afternoon.

Can you recall - that's Monday the 25th - was that an RDO?-- It was a non-production day.

A non-production day?-- That's correct, yes. A good time to do maintenance on the fan, for sure, yes.

And that's just as likely the reason why it's down, I take it?-- That is correct, yes.

Now, before we leave questions of the 22nd and this log and so forth, when you came out of the pit, or at least after you had done the checking, you reached a conclusion about the fact that the 8 parts was obviously not representative, it was incorrect?-- That is correct, yes.

Did Mr Kerr express a view about that too?-- No, he did not express - we expressed a view underground when - with the two sets of readings that we took and the confirmation of Mr Robertson, the deputy in the panel, that 8 parts was an incorrect reading.

Now, just one last thing on that point: you have taken Drager readings before yourself?-- I have done, yes.

On the long range tubes that we have heard that you take 10 pumps?-- That is correct, yes.

And that's what Steve Bryon had, high range tubes?-- High range tubes, that's correct.

Can you give us some idea if one just performed the normal pump procedure for 10 pumps, how much time that takes?-- It would take between three and four minutes to actually do 10 depresses.

If you worked efficiently, the minute one pump came out the length of the chain you would start the next?-- Yes, between three and four minutes.

And it could be longer if one let a little delay go after the chain coming to full stretch before the next pump?-- That's right. If you were doing other things or looking around and the chain was to its full extent, it could take longer than that.

Now, can I just ask you about some of the days which then followed after 1 August? So, the Monday when you were fully back after missing time sick?-- Yes.

On that Monday you had contact with Steve Bryon to do these figures?-- That is correct, yes.

And you have told us that the view you had was that the figures really confirmed what you had found on the 22nd, there was a general level?-- That's correct, yes.

No rise?-- There was - well, that on - there was a peak and that the general trend was around the 13, 14 or the 14 - between 13 and 14 over that weekend, yes.

And also onto the 29th when you plotted that day as well?-- That is correct, yes.

Now, on the Tuesday, which is 2 August, did you have anything to do with CO make in 512 or did you have any discussions with anyone about that?-- Just one moment, please. On the Tuesday?

Yes, Tuesday, 2 August?-- No, not with regard to CO make.

Did you go underground that day?-- No, I did not.

You can't recall any contact that day with people about the CO make. What about contact with anyone expressing concern

over either the level of the CO make or the trend or the range or anything else?-- No, there was - no-one had raised any concerns at that stage. I didn't raise any level of concern to anyone either.

The next day, which was Wednesday the 3rd, did you go underground that day?-- No, I did not.

We have heard that was a day when the board members of one of the companies went underground to 512?-- That is correct, yes, I had a day producing statistic figures and then also getting information for Albert for the afternoon.

Was that visit underground by the board members in the afternoon?-- In the afternoon, that's correct.

Did you have any contact with anyone that day which raised with you their concerns or general concerns about level of make, smells, hazes, all the things we have been talking about?-- No, not at all.

The next day, Thursday, 4 August, you did go underground that day, I think?-- I did, yes.

Was that a day when you went underground with Mr David Hill from ACIRL?-- That is correct, yes, David came for the - was scheduled for the whole day. He arrived in the morning and we left - he left late in the evening.

Now, can you tell us the reason for his visit?-- The results that we had obtained from the monitoring stations inside the 512 Panel were being discussed. He had -----

You mean the extensometer -----?-- Yes, the extensometer results, that's correct. That information along with information that he had on a new bit of software to update our geological strata model for future panel designs. The reason - the main reason for his visit was to look at possible designs for the 520 section, the one that we were going to start producing in the next four months.

So, 512 was discussed?-- 512 was discussed, yes.

And in the context of extensometer readings?-- That's correct, yes.

And was one of the questions that was the topic that day proposals to trial a 10 metre roadway?-- That is correct, yes.

Very much in the proposal stage?-- Very much in the proposal stage. David Hill had spent quite a considerable time in South Africa. They had actually trialled wide headings in that area. Again, this was getting - growing towards the concept of Moura No 2 becoming a pure development style operation.

Combine 10 metre roadways with a five metre coal height?-- On development you would go on the 3 - the 2.8 to 3 metre high

heading, and then on the return instead of using the ramping style that we did, if you had a wider heading - one of the options that we used in South Africa was to physically pull the entire panel back to the start of the transfer point, ramp down onto one occasion - ramp down onto floor once and then put the belt straight down on the bottoms and work inbye on that, and the 10 metre wide heading would give you better - well, once you had rib supported properly, you would get better productivity rates from that on the inbye.

And in your conversation with David Hill that day was the method of ramping that was being used in 512 discussed as well?-- Yes, from a productivity point of view, identifying that - David identified that that type of mining system was quite an arduous task on the machines that we had at the operation, and we were looking at a whole lot of different options and varieties and different types of systems that we could utilise at No 2.

Now, you and Mr Hill went down the pit?-- That is correct.

About 1 p.m.; is that correct?-- Yes, it was early afternoon, yes.

To which section did you go?-- We went straight to the - our first port of call was the 512 section.

Can you just tell me: where did you go in that section by reference to cross-cuts and headings?-- The crib room at that stage was between - was just in between 1 and 2 heading in the 510 section, cut-through 2, 510. The Rover dropped us at that location where we met Steve Bryon who was the deputy on shift. We then - I then said to Steve that - introduced Steve to Dave; they had already met on previous occasions.

Can you just pause there? Did Steve Bryon say anything to you about any concerns to do with 512 that day?-- No, he did not, no.

All right. You met there at that point, and did you then move into the section proper?-- That is correct, yes.

To which point?-- At that time the miner had just completed the taking of bottoms between No 1 and No 2 heading - I beg your pardon, No 1 - yes, between No 1 and No 2 heading in 1 cross-cut. So, they were just - when we came there, they were just in that intersection one pillar inbye of the crib room, so you could effectively see the miner from the crib room.

Did you go somewhat inbye of that intersection?-- Yes, we just went past the intersection towards the goaf, but only about 10 metres - 5, 10 metres into the goaf, just to have a look at what the goaf was like.

Did you notice then or did anyone mention to you that they had noticed anything unusual?-- The only unusual comment that - or not unusual comment, but the only comment Dave had made was the fact that the boys had cleaned up quite significantly better than they - or to a larger degree than they had in the early parts of the panel.

Nothing abnormal in terms of smells, or heat, or haze, or anything that we have been discussing?-- I did not identify any of that, no.

What about the velocity or apparent velocity of the ventilation?-- At that stage it was very - the dust was carried away quite well down the No 1 heading - No 2 heading, I beg your pardon.

Where did you go from there?-- David wanted to have a look around number 3 heading. We just walked up to the number 3, had a look into the goaf, and then came back out towards the crib room where Steve Bryon was.

Then where did you go?-- I then notified Steve that we would be going into the return.

The top return?-- The top return, No 1 heading, just so that Dave could have a look into the goaf to have a look at the remnant pillars that were formed.

Up to that point, you mentioned that you had gone along - I assume it was 1 cross-cut to No 3 heading?-- That's correct, yes.

Anything abnormal on that perambulation?-- No, not that I can recall.

Now, you went into the top return. What did you do there?-- We basically walked through the prep seal and then walked down to every stopping that had a hole or brattice over it and David wanted to peer inside as far as he could. Because we had taken bottoms up to 10 metres from the stopping itself -

and in some cases it went a little bit further, closer towards the stopping - some of the stoppings you couldn't physically get through them and stand on the goaf, you just had to physically look through the plaster board or the hole or the door or the brattice, whatever was there, yes.

And I take it from what you say in some of the cases you could get through the hole?-- Some of the case you could get through and stand on the edge, yes.

Did you and Mr Hill do that where you could?-- At every location where we could, that's correct.

How far down the top return did you go, looking or going through all the holes and stoppings?-- I don't know the exact location. My memory - the recollection of my memory only gives me an indication that we went all the way down to between 11 - 10, 11, 12 cut-through, around that area, only because I saw the openings in the stoppings, right at the bottom of the panel.

You saw that at the stoppings?-- That's correct.

Now, where you could, you went through, and where you couldn't, you looked through?-- That is correct.

Now, on that inspection down there and during that process, did you observe or did Mr Hill give you any indication that he might have observed anything abnormal - smells, hazes, heat, anything?-- Not with regards that, not at all, no. He was just very surprised that the pillars had stood up as well as they had done and that basically - his reason for wanting to go and have a look in the panel was to confirm the extensometer results and their readings with what he could physically see underground.

Now, having got towards the bottom of the panel, did you then come back out the top return?-- That's correct, yes.

Did you do anything more in 512?-- Not in 512. Oh, the other thing that David wanted to see - he hadn't actually traversed No 1 heading - he just wanted to identify the section between 5 and 7 cross-cut - where we had taken bottoms and left canches on either side, he wanted to physically have a look at that, see what it looked like, with a view to getting an idea about this 10 metre wide roadway, and also at that location we had the extensometer and copper tubing that ran from the internal 512 to the actual monitoring location in the 5 South heading via a borehole. He had not seen that before. He wanted to physically see that.

When you got back up to the top, did you speak again to Steve Bryon - section deputy?-- No. Before we went into the return I had told Steve that we were going down No 1 heading and then straight into the 5 South bottom return to do the monitoring.

And is that what you did?-- That is correct.

And eventually you returned to the surface and was there some

conversation with Mr Schaus, Mr Mason or Mr Morieson?-- No, I think after that we went into the 510. From there we walked down to the 510 to the drilling section. That was for my purpose. And by the time we came out at that stage, it was well past - it was 6 o'clock, 7 o'clock, yes. No-one else was there.

Now, on that Thursday, that's 4 August, was there a usual sort of meeting that was held that day?-- That is correct, yes.

That is to say every Thursday - not necessarily the 4th - Thursday?-- That's correct. That was the overtime meeting.

Explain to me what that is?-- Every Thursday Mr Mason would call together the engineering people - the people from the engineering department - the electrical and mechanical engineers - and they would set out a plan of what work they proposed to do over the weekend and that was organised on Thursday - every Thursday.

Were you at that meeting?-- I was not at that particular meeting. Albert and I were with David that morning.

So, did you find out about the results of that meeting?-- Yes, we had - yes.

When did you find that out? Was that the next day at the production meeting?-- I can't recollect an actual time when I found that out, but there was - whether it would be the next day or on the list - the overtime list that Mr Mason had worked out.

But documents were produced? Lists of tasks, and so forth?-- Yes, that's correct. Tasks were listed and then the number of people that were required to perform those tasks were listed on a specific QA overtime sheet.

That was a regular feature of that aspect of mine planning - that tasks would be documented and listed and put through the QA system?-- That's correct, yes.

On the next day, which was the Friday, 5 August, did you go underground that day?-- No, I did not go underground that day.

You mentioned that you had - I think it was - I can't remember whether it was yesterday or the day before - you had spoken, I think, to Mr Schaus about stoppings in the top return?-- That is correct, yes.

Was that on that Friday?-- That was in the morning of that Friday, that is correct.

And you were asking him, you know, what was the reason for the holes in the stoppings down the top return?-- That is correct, yes.

Did you have contact with Steve Bryon on the Friday - that's 5 August?-- Yes, I did, at the end of the day - towards the

end of the day.

Did he provide you with some results for the purpose of plotting on the graph?-- That is correct, yes.

Can you recall in what form he provided them to you? Did he have some log, piece of paper, report, something written, or did he just read something out to you?-- My best recollection is it was just on a piece of paper - a pocket notebook or piece of paper.

Did he tell you something about the particular results he was giving you - as to who had got them?-- That is correct, yes. He said that part of his duties on that Friday as an acting ventilation officer was to check all the water barriers - that they were topped up, and their location - he had done that for the better part of the day - and that Dick Stafford had taken a reading for him, and that was the reading that he presented to me.

All right. You noted something about the readings. You can look at Exhibit 21 to see what they were - that's for 5 August. Did you note something about the velocity?-- Yes, I did.

What was that?-- I noted that the velocity was 1.55 metres per second. That was down - or a lower reading than we had previously experienced through the - over the last couple of weeks.

Did you ask Steve Bryon about it - ask him what the reason was?-- No, I did not ask Steve at all, no.

Did you have a view about why it had happened yourself, or did you go and find out why?-- No, once I published the log and the graph, Steve signed the graph. He then took that particular graph to the deputies' office, or deputies' room and I took the other copy to the undermanagers' room and I asked George at that time what actually - I pointed out the lower velocity in that panel for that day.

And what did you find out about that?-- George had said to me that a deputy's report earlier that morning indicated that there was some layering in the 520 panel.

Just point out 520 on the map for us. You will have to flip it down?-- The 520 panel is located around there.

So, it is the bottom of the 5 South section and is like a stub in a north-westerly direction from it?-- That is correct, yes.

He told you there had been some layering of what?-- Of methane in that general area and a decision was made that the regulator in the 5 South bottom return was to be-----

Can you point out where that is - that is to say, the position of the regulator. We know where the bottom return is. You can do so on the big relief map or the general map, if you

like?-- The regulator is located between cut-through 19 and 20.

In the bottom return of 5 South?-- That's correct.

So, what was to be done about the regulator?-- That bottom regulator was to be opened up so as to be able to remove that layering in the 520 panel.

And as you understood it that had been done?-- That is correct, yes.

Did that explain to you the drop in velocity for 512?-- That is correct, yes.

And would that lead, in your judgment, as you told us on a previous occasion, with lower velocity to higher CO parts?-- That is correct, yes.

Is that what we see reflected on that reading for 5 August?-- That is right, yes.

Now, when Steve Bryon brought you the figures that day, we are talking about 5 August, on the Friday, did he bring you all the figures that you needed to put in?-- That is correct, yes.

Including the Maihak average?-- Yes.

Can I ask you this: on that day, that's 5 August, that was, as we know, the first day that Mr Morieson was back at work even though he wasn't rostered to come on. He came in to fill in a deputy's position or a miner's position?-- A deputy's position on afternoon shift.

Had you spoken to him in the few days leading up to that time?-- Yes, we had dinner with him on the Wednesday night.

I suppose it's a trite question, but did you discuss matters to do with the mine?-- Yes, we did dig coal, yes.

Specifically in relation to 512 and its CO make levels and things like that, did you discuss them with Mr Morieson?-- I did discuss the incident on the 22nd, yes.

Did you fill him in on what had been found in the 18.98 and so forth?-- That's correct, yes.

So he certainly would have known that when he was at work on the Friday?-- He was aware of that, yes.

Can I ask you one other thing? You mentioned yesterday - it may have been the day before - you were asked a question in relation to the Graham's Ratio?-- Yes.

That's the CO/O2 deficiency ratio?-- That's correct, yes.

I think your general comment was you didn't really know much about it or pay attention to it?-- That is correct, yes.

But as at the date of this explosion did you have some understanding about its usefulness or otherwise in a post sealing situation?-- Yes, the general formula led me to believe that once an area was sealed that that formula became nil and void because there wasn't any air physically flowing past that monitoring point because methane displaces oxygen and a whole lot of other things, and the fact that you weren't having fresh air passing that point all the time, you know, I

made the assumption, in my terms, that it wouldn't be relevant after sealing.

Is that a view that you understand is held by others?-- I'm not sure on that. That was my view.

Certainly your view at the time?-- At the time, that's correct.

Can I ask you about the procedures that were done for methane drainage, and I will talk about the actual formal procedures, the written documents?-- Yes.

You had a hand in producing those, I think?-- Yes, I did, yes.

Could the witness see Exhibits 57 and 58? Now, are they the documents that are referred to as the methane drainage procedures?-- Exhibit 57 is the gas drainage procedures and 58 is a list of work instructions. There is a difference between the procedures and the work instructions.

We know what the two documents are, but they are the documents that you worked on to produce in relation to that area?-- That is correct, yes.

You can hand them back. Can I ask you about the Tecrete seals that were used at Moura? When did you first become aware of their use at Moura No 2? Was it in relation to this 4 South panel?-- The Tecrete stoppings were used well before my time. Tecrete as a company had been introduced to Moura before '92. As Tecrete developed new ideas one of their new ideas was the Tecrete mesh block and to be able to use that for prep seals. The first time we actually used one was in the 4 South Level area and that was basically a trial to see what the blocks were made out of and what their structure - what the structure was like once it was constructed.

Did you have some interest in that? Did you pay attention to the way it was done and the results of it?-- That is correct, yes, I did.

Did it have some advantages over using the previous system which was concrete block?-- In my opinion it had a significant number of advantages.

Which were?-- The list would go from the fact that the mesh blocks were a lighter product to work with, secondly, you were pumping an homogeneous cementatious grout into a void or basket so you would get a better seal, and thirdly, the expected rate of construction could be quite significantly faster once developed. Using those three major benefits we thought that that type of system would be far superior than the bricks, including the fact that you would place roof bolt reinforcement reo from roof to floor and rib to rib.

You regarded all of those features as a significant improvement over block?-- That is correct, yes.

Did you in fact generate some documents for the purpose of

showing people how to insert the bolts and the general design of various Tecrete seals?-- Yes, I constructed the work instruction, yes.

We have seen that document, I think. I don't think I will show it to you again. Now, did you have some knowledge or at least some understanding of the strength of Tecrete?-- Yes, the brochure said that it had a 60 mPa strength.

And mPa is how many kPa?-- It's to the six - 10 to the six.

It's much higher than kPa?-- Yes, kPa is 10 to the four, yes.

60 mPa is a significant increase on 345 or 375 kPa?-- That is correct, yes.

You are working there from brochures; you haven't done any tests yourself?-- No, we had not done any tests ourselves.

There is one other thing I want to ask you about and that -----?-- If I could just add something, the first time we used the seals were in the 4 South Level for us to obtain an - to get an idea of what the seals would look like and how to construct them. Steve Bryon, the check inspector at that stage, was - the seal took a long time to construct, but the finished product was quite a superior product and that was his opinion too after looking at the trial seal.

Did it take a long time to construct because it was done over a number of shifts to let everyone have a look at it?-- That's right. It was only done on one shift per day with fellows that were - they had not seen that type of method, and Robert Parker was the gentleman that was there to instruct them how to construct it.

Can I ask you something about a different area? In relation to the communication of information deputy to deputy and deputy to undermanager and so forth, was there some work being done in relation to the production reports by deputies?-- Yes, it was. We had discussed trying to develop systems whereby the deputies would have more of an organisational role in their respective panels with regard supplies and what they needed to do the next day and things like that, and then to give the - basically the undermanagers at No 2 were performing deputies' duties and then, you know, more senior management were doing planning duties. We were trying to give more onus on planning to the people that were in charge.

Namely deputies?-- Namely deputies and also the undermanagers.

Did you have in mind introducing a more descriptive form of deputies' report?-- Yeah, it was in the throes. It was very much a discussion stage at that time prior to the explosion. Nothing had been put down on paper.

It was not an area that was being ignored?-- No, Albert Schaus was looking at a lot of work practices that were going to be evaluated and looked at from the union side and also from the

company side.

In relation to the reports was there some contention on the part of the deputies about the amount of time they had to spend doing that sort of report?-- Yeah, the deputies before my time were paid an allowance or an overtime to some degree, I think, to fill out reports or some came in a little bit earlier. I don't know at what stage that was taken away from them, and then they basically stopped filling out statutory reports for planning or for requesting material or information. They completed their statutory duties, the inspections -----

But not the planning?-- But not the planning stage, and we were trying to look to go back towards a system similar to that.

In relation to the period after the incident, on the 7th you mentioned yesterday the presence of an incident team at the mine site?-- That is correct, yes.

On that incident team were a number if not most of the inspectors?-- That is correct, all inspectors.

Was there a union representative on that team as well, Mr Matt Best?-- He was there for some time, yes.

Those people had access to the mine offices and documents?-- Yes, everything was opened up, yes.

Do I understand correctly there were a lot more people therefore through those offices than there would be normally?-- Yes, that is correct, yes.

What was your role in relation to data and documents? Were you part of the incident team itself or were you just like a gopher, if I can use that term?-- I was not part of the incident team itself. When - if they requested work to be done it - I would be given respective tasks to complete that work. The main task over the two days was to establish what atmosphere we had underground via the boreholes. So at that stage it was lowering a Unor tube to respective sites or via respective boreholes and then sealing off boreholes because - so as not to have contaminated data.

Your role was really a responsive; one if you were asked to do a task you did it basically?-- That is correct, yes.

Now, can I ask you one last thing if I may, and that is in relation to some of the data which we have seen, namely the alarm logs and some reports that suggest slightly high methane levels in 510?-- That's correct, yes.

On the Saturday?-- On the Saturday, yes.

Now, we have heard that the span gas tests were being done on the Saturday and some high methane levels were recorded there and one of the deputies has given evidence that he had an explanation for that, namely it was Bob Newton cracking the

seal or cracking the valves and draining the methane, draining water out?-- Draining water out of the water trap, yes.

Now, do you have a view of an alternative possibility in relation to the presence of methane in 510 in that area?-- An alternative, I don't know how feasible it would have been at that time, but an alternative would be one of the victaulic seals physically being blown and therefore allowing larger quantities of methane to -----

To leak out?-- To leak out, yes. At that particular time we were really beyond the peak flow that we had produced from the nine holes that we drilled between 510 and 1 North West, and what I'm saying is that the range was obviously subjected to a lot more pressure earlier on in the piece and not specifically at that time. That's my only reason for hesitation with regard to a possible seal leakage at that time.

Do I understand correctly, you get water and coal dust going

up through the system possibly to the surface?-- That is correct, yes.

There is a flame arrester at the surface?-- That is correct, yes.

And the purpose of the flame arrester is to stop a reverse ignition going back down the range?-- That is the purpose of the flame arrester, yes. What we had done over the years, we had installed a number of water traps at the hole itself and we had also installed a - what we called a horse. It was just a - the pipe range was a six inch diameter. We increased it to about 120 - we just put a big cylinder in line and that assisted us by dropping the velocity and, therefore, dropping the water out of the range with coal dust and everything else. So, that effectively stopped the coal dust from being - from travelling all the way up to the flame arrester and blocking the flame arrester.

As a possibility, you think one - we should, or somebody should consider whether the pressure on the range may have resulted in a rubber seal being blown?-- A rubber seal could have worn over that time and then, you know, sequentially leaked over that period, but on the Monday morning Ken Guest, a deputy, and myself after the incident about 4 o'clock in the morning went to the surface boreholes to see if any methane was physically coming out of the boreholes. So, we would have - we took - we would have had to take the flame arrester out of its casing. At that time there was only fresh air at the surface of the boreholes and the flame arresters were clean.

I have nothing further, thank you.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Abrahamse, can I take you back to Exhibit 12, which I think is the position description you were shown by Mr Clair initially. You don't have that in front of you now, I don't think?-- No, I don't.

And you may not need it. You have agreed, I think, that part of it, point 7, refers to part of your role being to assist the ventilation officer with mine ventilation requirements and modelling for future mine panel designs?-- That is correct, yes.

So, part of your role was to assist the ventilation officer who was, we know, for most of the time, Allan Morieson?-- That is correct, yes.

But I understood you also to say that you had no day-to-day control over ventilation matters in 512?-- No, that was the undermanager's role.

So, he had the ultimate control of how the ventilation requirements would be satisfied in 512; that's the undermanager in charge?-- When you say "control", could you -----

Well, the authority, I suppose, to - the authority to change and oversee the entire system inside 512?-- Yes, yes, the undermanager in charge and the undermanagers, yes.

And the ventilation officer himself, Allan Morieson, wouldn't have that authority?-- No, he would be the doer.

On the undermanager's instructions?-- That is correct, yes.

Well, somewhere in that range of matters comes your role to assist Morieson; is that so?-- That is correct, yes.

You had no authority yourself to direct Morieson to do anything in terms of ventilation?-- No, not authority, no. Allan wasn't responsible to me or me to him.

These position descriptions were part of what is said to be the Quality Assurance or QA system in the mine?-- That is correct, yes.

Given that part of your function was to assist him, was there a procedure to cater for the situation when you weren't at the mine?-- As part of my position description it says that if I wasn't at the mine, the manager or the underground superintendent would either allocate my roles or he would take them on himself.

So, if, for instance, you went on holidays, which you did, I think, on 16 June until 11 July?-- Yes.

The role of assisting Morieson with his ventilation duties would have fallen to the undermanager or someone delegated by him, you would expect?-- I would expect, yes. We ran a very tight ship with numbers of people at - you know, duties just flowed between one another.

You say you ran a tight ship. Was it tight but informal?-- That's right, yes. If I was asked to do - if I was asked to do a specific task, well then I would go and do that. It was - yeah.

As far as you know, when you did go on holidays, there were no discussions with you about who would be filling your role of assisting, if necessary, the ventilation officer in your absence?-- Well, "assist the ventilation" was really in its broadest sense, looking at the life of mine, overall layout, where overcasts should be, a planning role as well as if Allan needed assistance for - like he did with his monthly ventilation reports, you know, cataloguing them or collating them.

Is it fair to say that you fulfilled that requirement of your position to assist him mainly in the area of setting up this graphing and tabulating the information about CO make; that

was the main way you assisted Allan Morieson with his ventilation duties?-- That was one aspect, yes.

Was it the main aspect?-- The main aspect for the CO make. There were other - like I said, a lot of other aspects. We worked together designing what size overcasts we needed, what depths that we needed to grade to on the floor, where we needed them, the location, the size of them, all those things. We had a number of projects. The report that was submitted to Andy - from Andrew Selff listed quite a number of recommendations, and those recommendations initially stated that the overcasts needed to be done. There were things like pressure chamber seals that we were going to look at, modifying existing overcasts to reduce pressure that - the pressure drop that was current at our main overcast over our dip. There were a lot of functions, looking at taking away major restrictions such as in one location the 1 North-west return had a major kink in the line, we were looking to blow some of that coal away; all of those sort of facets.

All right. Just returning then to the Quality Assurance side of things, to your knowledge was there a procedure for someone to replace Allan Morieson when he was absent from the mine as ventilation officer?-- There wasn't a procedure to say, "This is what you had to say to the next fellow." Allan's position description was available. Not only did he do CO makes or monthly ventilation reports, he looked after all the firefighting, the underground water barriers, stone dust collecting, fire extinguishers, making sure they were all up to scratch.

You see, what I am asking really, I suppose, is: was there a procedure in place to make sure that whoever replaced the ventilation officer was someone who was competent to carry out that role at the mine in his absence?-- There wasn't a procedure. The system would be that his position description was made available in the end office and for that procedure - for that position description to be - that could be read with all his work procedures, his stone dust procedures, his firefighting procedures and his ventilation procedures.

See, the evidence tends to indicate here that when Allan Morieson went on holidays, his position was filled by Steve Bryon?-- It was, yes.

But that before Morieson went on holidays he had no opportunity in the end result to speak with Bryon and inform him as to his duties and the way they should be carried out?-- That's correct, he did not, yes.

Was the system designed for Morieson ideally to have spoken to Bryon before they changed roles, or didn't they arise?-- On that particular occasion it didn't arise. The system in place allows you to look at those position descriptions which are made readily available and the procedures in that end office, but I did not - I did not show Mouse any of those procedures. The stone dusting itself was an aspect of the mine that many of the deputies knew how to perform.

I suppose the stone dusting, though, wouldn't have been - well, I withdraw that. The most important role for the ventilation officer would have been looking after the actual ventilation on the site at 512; is that so?-- That would be one of his aspects.

And would you agree one of the most important aspects of his duties?-- All statutory aspects are important, and that is one of them, yes.

The ventilation of the panel is vital to the safe operation of it, isn't it?-- Yes, well, without ventilation underground you wouldn't be able to operate. It's not for the one panel.

In any event, you say that the person relieving Morieson would have had access to Morieson's position description as a QA document?-- That is correct, yes.

Which would simply set out descriptively what his duties were?-- That is correct, yes.

Without explaining how they were to be carried out?-- Yes, you would not get a blow by blow description of how he did things, no.

That would rely upon the outgoing ventilation officer perhaps?-- That is correct, yes.

Instructing the incoming, relieving officer, in what was required?-- That is correct, yes.

And that doesn't appear to have happened in this particular case when Morieson went on holidays on 17 July?-- No, not to Steve Bryon it didn't, no.

Again, looking back on it, that's obviously undesirable, isn't it?-- It is a system that needs to be refined, yes.

And the Quality Assurance system is designed to deal with problems such as that, isn't it?-- That's right, it will highlight those type of problems. I mean, giving fair credit, we had just introduced the system.

And you were still developing it?-- It was in its infancy, yes.

So, that system ordinarily, and hopefully in the future, would ensure that when a change of position occurs like that, the person taking over would be well aware and qualified to carry out the role?-- That's correct. My recommendation would be at the bottom of each of those descriptions - an authority would state that if - when on holidays, there is a time period where maybe those duties should be shared. I mean, that if - I did most of the - I put together most of these position descriptions. That is another little paragraph that I would put into that, yes.

Now, as you have agreed, I think, the main assistance you gave to Allan Morieson is in the area of CO make and its

calculation for that panel; is that so?-----

MR MORRISON: No, he didn't say that.

MR MACSPORRAN: Well, that was one of the main areas you had experience in dealing with Morieson?-- That was one aspect, yes.

And, for obvious reasons here, an important aspect?-- Yes, yes, it is an important aspect, yes.

And you were aware back in - well, early, I suppose, around July, June/July, you were aware that the CO make inside 512 was an important matter?-- Yes, it is an important matter, yes.

And it's an important matter in the detection of spontaneous combustion?-- That's why that system was in place, yes.

You say it's the very reason why it's monitored?-- That is correct.

Because it can be an indication of a serious problem inside the mine?-- That is correct.

You know also, as I think you have said, that it's important to establish some sort of background to the CO make inside the panel to know what it might do in the future?-- We had just embarked on that idea at the beginning of that 512 Panel, that is correct.

And you have told us you had fairly extensive discussions with Allan Morieson about that very matter?-- We had discussions. I'm not sure if I would use "extensive" in that term.

Well, if you were going to assist Allan Morieson in looking after the CO make in 512, you would have to have extensive discussions with him, wouldn't you?-- Well, realistically, my hand in the 512 CO make monitoring was only the latter half - the latter end of the panel. I did not really - I wasn't there for the middle stage, the June/July, of that panel. That was really a job that Allan performed and was able to complete and do himself and hand it to the respective people. He didn't really need my assistance to produce those graphs.

Well, he did initially, didn't he? That's how you set up the system, so he could produce the graphs?-- Yes, that was in 19 - end of '92, yes.

Before -----?-- This is 1994, yes.

Well, you were absent, I think you have told us, between 16 June and 11 July?-- That is correct, yes.

Before you went away and at about the time extraction started in 512 you spoke with Morieson about what he expected to be the CO make for 512?-- That is correct, yes.

And were those discussions extensive?-- They were a question

that I asked Allan in the room. We were sitting down and I asked him, you know, what the chances were. If you would like to define "extensive", I could - you could put a time limit on it, I -----

Put it this way: did you consider it an important matter to discuss with him?-- It was an issue, yes.

An important issue?-- An issue.

You didn't consider it to be important?-- It was important but it was an issue. I was finding my way around the understanding of what was happening at Moura itself.

These discussions, however extensive they were, concerned establishing a background CO make to enable you to interpret the CO make that came out of 512 after extraction commenced?-- Yes, not only 512, the rest of the mine too, to get a background of what the rest of the mine was doing.

But we are dealing with 512?-- We are dealing with 512, that's correct.

And you have told us how 512 was a new system of extraction and that raised prospects of the CO make coming out of 512 being somewhat different from other panels?-- That is correct, yes.

And this was all discussed between yourself and Morieson?-- Yes, he said that - and in as broad a terms as this: the fact that the type of mining system, the take a row, leave a row, and the ramping would leave, you know, possibly a little more loose coal, yes. The other rib stripping systems of taking two sides of every pillar leaves quite a - we left quite a substantial remnant pillar, you know, as in the 511. The remnant pillar was of a dimension of 23 by 23 metres. There is a big difference between that being able to carry a load, a sandstone load, compared to a five metre fender that was left in the take a row, leave a row scenario.

All right. Now, coming back to the actual CO make itself?-- Yes.

These discussions with Morieson resulted, you think, in him saying that he expected a final CO make out of 512 to be about 14 lpm?-- That's correct, yes.

Based upon, he thought, a base figure of about 2?-- That's correct.

An increase per week of about 1 lpm per week?-- That is correct, yes.

Now, again, that was a very important matter, wasn't it, the behaviour of the CO make coming out of 512?-- It is an important matter, but we - he was only giving his opinion and I was - we were in the early throws of trying to understand what was happening.

So that you could closely monitor the CO make in 512 as extraction progressed?-- That is correct, yes.

So, you needed to know a base figure so you could properly interpret the data coming out of 512?-- That is correct, yes.

Because without that information or that investigation, the results coming out of 512 could be quite meaningless?-- They say with collecting data, rubbish in, rubbish out, yes.

So, you had also the basic guideline from Strang and Mackenzie-Wood's information or book?-- That is correct, yes.

A figure of between 10 - 10 requires you to take notice and possibly look into the situation?-- That is correct, yes.

And then 20 or over indicates a worsening and possibly dangerous situation?-- A possibly dangerous situation, yes.

Those figures are subject to the background of any given panel?-- That is the way we interpreted it for 512, that is correct.

So, again, the background you established - it's pretty important in terms of relating it to the base guidelines of 10 to 20 lpm?-- Yeah, we were trying to understand that, yes.

And the way you are trying to understand it was by yourself and Morieson having discussions about it?-- We discussed it at the early throws of the panel, yes.

And Morieson was a deputy?-- That is correct.

And a ventilation officer with some experience as a ventilation officer?-- Prior to me arriving there, he was a ventilation officer, that's correct.

And you had, I think you have conceded, at this stage we are talking about, very little experience in the area?-- In the area of mine gas analysis, that's correct, yes.

And that's why you weren't prepared to challenge any opinion that Morieson had because he was the more experienced of the two?-- That's correct, yes.

But Morieson himself wasn't an expert in either spontaneous combustion or assessing CO makes and establishing backgrounds of CO makes in panels, was he?-- No, but his 15 years' experience at No 2, I think, would have some standing in making that evaluation.

You have told us he was the one who advanced the theory that possibly you would expect a higher CO make from 512 because of the method of extraction?-- That is correct, yes.

But there was no - as I understand, from what you have told us, there was no attempt by either yourself or Morieson, to your knowledge, to further investigate that background in 512?-- At that stage, no, there was not, no.

Well, not at any stage?-- Not at any stage, no. If I can make the comparison with pillar design - and that's what I'm more familiar with - once you obtain information about criterias at the respective site - not in New South Wales and not up at Collinsville, but at Moura - then only can you make proper evaluations on what is actually happening at that mine. It is very difficult to take one system out of one area and place it into the next. So, it is all horses for courses, so to speak.

You are really agreeing with the proposition that this discussion leading to Morieson's assessment of what the make might be in 512 was very much based on not so much guesswork, but quite shaky ground, because you hadn't started extracting in 512?-- I won't deny that, no.

And that would lead you to the need, would it not, to very closely monitor the progress of a CO make after extraction commenced?-- It was closely monitored on a weekly basis.

But there was a continual belief that an increase in CO make inside 512 would relate to this different method of mining?-- That was the only fact that we had to go on, yes.

But you had no real scientific basis to hang your hat on that proposal, did you?-- Like I said before, no.

But it was continued to be said to be the cause of the increased CO make?-- Yes, that's correct.

Really without basis?-- I can only answer that in the affirmative, yes.

There were means at your disposal as early as just prior to the commencement of extraction to get some help - scientific help to determine the likely CO make coming out of 512?-- Yes, I was aware - would be aware of groups that could assist us in that sort of decision making, yes.

Can you just tell us briefly what sort of groups you would have had or could have had in mind as at April 1994 to assist you with this exercise?-- I mean, obviously the most - the first group to come to mind are the SIMTARS people.

SIMTARS?-- Yes. They could possibly help us, yes.

It was your experience as at April 1994 that SIMTARS were readily available and would have been, you'd expect, cooperative?-- If we had asked them about that particular issue, yes.

Your experience with SIMTARS was that they were prepared to help, if requested?-- I did not have any - I knew Col Hester, but only from knowing that he was on site occasionally, but no representatives had actually physically come to us and said, "This is what we can do for you." They didn't do that to me.

The point is that you understood, even then, that SIMTARS was available to assist if necessary. You could have gone to SIMTARS?-- The entire mine industry knows about SIMTARS, yes.

And appreciates their expertise?-- Yes.

You could also have gone to Dave Kerr?-- Yes.

Possibly as another person to approach?-- Yes, we could have, yes.

Your experience had been in some gassy mines in New South Wales, hadn't it?-- Technical experience from the sense that I was in that area.

You had been working in areas in New South Wales-----?-- Not technical, but just on a - the fact that that area was liable to spontaneous combustion, yes, that's all.

You had some relating to you by personnel at those mines of experiences they had had of spontaneous combustion and how they dealt with it?-- Yes, good stories, yes.

There would have been some experts, I suppose, in that area in New South Wales, if necessary, that you could approach to talk about this problem in 512 and its possible CO make?-- There would have been possible people, but I would not be able to recollect anyone in particular.

In any event, you didn't have to go past SIMTARS in Queensland, did you?-- No, if we want to get that information, no.

Furthermore, you also had available to you the considerable experience of George Mason, the undermanager in charge?-- That is correct, yes.

Who had had, as you knew, wide experience with mines subject to spontaneous combustion?-- Yeah, George had been at No 2 and No 4 for a long time, yes.

Had George been at Kianga as well?-- I think he had. I'm not 100 per cent sure. I can't remember.

You also had access to Albert Schaus, the manager?-- Yes, that's correct, Albert was there.

In any event, it is correct to say, isn't it, that you didn't approach - neither yourself nor Morieson approached any of those people we mentioned to try and sort out the problem with 512 - potential problem with 512?-- Not in its design stage, no.

By that you mean not in the assessment of what the CO make should be, or possibly could be that would come out of 512 during extraction?-- That is correct, yes.

Why? Why was there no step taken to more thoroughly determine what the CO make might have been in 512? Was it not considered important enough at that stage?-- At that stage, no. It was - I did not consider it.

Again, it is easy looking back on it?-- Very easy looking back on it, yes.

It is obviously a significant factor, isn't it - the behaviour of the CO make inside a panel?-- That is correct, yes.

In terms of detecting, in time, a possible spontaneous combustion?-- That is correct, yes.

And what happened here was there was some figure latched onto of 14 lpm as the expected level, and it was never addressed significantly again, was it?-- I'd like to clarify that.

Certainly?-- On the 22nd when we did go down with Dave Kerr, who was a very experienced person in that field, he at that stage again gave me no indication that the level that we were running at - the 5 to 6 parts in the top return - was of any concern. That gave me a comfort zone, if I can call it that. I was comfortable with the fact that Dave had been underground and he had not said anything about that.

And what made you comfortable with that was the fact that you relied upon, as you are entitled to do, Dave Kerr's considerable experience and expertise in the area?-- That's correct, yes.

But you know, don't you, that Dave Kerr didn't have the full facts about the behaviour prior to that time of 512?-- I did not know that. Obviously, from sitting in this Court, I was

not given the full facts either.

No. In fact, you were drawing comfort from Dave Kerr's lack of concern about 512?-- That is correct, yes.

Dave Kerr didn't know that there had been some sign, such as smells, reported prior to that time inside 512. You now know that?-- I now know that, yes.

You were drawing comfort yourself when you didn't know that there had been smells reported inside 512?-- I was unaware.

So, you and Dave Kerr were completely unconcerned about what was happening in 512, but didn't have the full facts?-- From this Inquiry, we understand that now, yes. At the time, it wasn't the case.

See, Mr Morrison asked you yesterday whether or not Dave Kerr, the person with the experience, had suggested any further investigation inside 512 on 22 July; remember that?-- That's correct, yes.

You said "no", that Dave Kerr had been satisfied with what he had found, there was no concern, and you came up from underground?-- That is correct, the three of us did.

But again, you see, Dave Kerr - one couldn't be critical of Dave Kerr not conducting a further investigation if one realises Dave Kerr did not have the full facts?-- I can understand that, yes.

With the facts that Dave Kerr had, and indeed you had, the investigation you conducted was more than adequate?-- At that time, yes, I thought - I went home that night feeling easy, yes.

Had you had the full picture, your behaviour and your investigation on 22 July may have been different?-- It might have been different.

And probably would have been?-- Yes, I think so.

You see, you have been taken through this I think by Mr Clair, but there were deputies' reports that indicated the signs inside 512 to be concerned about and, in summary, those were: smells, layering in the No 2 top supply road, recirculation in the same area - all of those features that had occurred prior to the 22nd of July, you have now been made aware of those features, haven't you?-- I have been, yes.

But you had no idea of any of that when you conducted your investigation on the 22nd?-- That is correct.

Just to return to the assessment of what the CO make should have been in 512, your recollection is that it was going to be about 14 by the time the extraction was completed?-- Yes, it was a best guess, like you said.

And that was based upon the discussions you had had with

Morieson?-- That is correct, yes.

Now, are you sure that Morieson said to you that it was going to be about 14 at the end of the panel's life as opposed to some other figure?-- No, no, the reason - it was a joint sort of discussion at that stage. I had given him the fact that we would be in the panel for 12 weeks, using the production schedule that I had developed, and with the two-----

All I'm simply asking is if you actually recollect Morieson telling you a figure of 14 as opposed to some other figure?-- No, no, 14 is the figure we talked about, yes.

See, I suggest to you that Morieson in evidence here gave a different figure. He said his assessment was a background figure or a starting figure, if you like, of 2 lpm in the second phase that work started, and a rate of increase which would leave a final figure of about 12 lpm at the end of the panel's life. Does that jog your memory at all?-- No, it does not.

You still recollect 14 as being the figure discussed by Morieson?-- The life of the panel being 12 weeks on extraction, at 1 litre per week, that's 12, plus the 2, making it 14.

All right. There is a difference, obviously, between 12 and 14 lpm in terms of the CO make at the end of the panel's life?-- I beg your pardon?

There is a difference between 12 and 14?-- It is like the grey area between 18 and 20.

And that is much more in the grey area than 12 and 14?-- Yes.

In any event, your recollection is it was 14, not any lower figure?-- Yes, that's what I recollect.

Once you determine whatever the figure was for an expected CO make, factors such as signs consistent with spontaneous combustion inside the panel would lead you to rethink such a figure, wouldn't it?-- For sure it would. If you are running at 5 lpm and if you had a stink and a haze and everything else, that would be a concern at that level.

Right. Well, again, I don't want to take you through all of the signs that had been reported, but there were signs you now know that were consistent with a spontaneous combustion inside 512 prior to July last year?-- There was indications that people had smelt something, yes.

Had you known that, would you have reassessed the figure you would have expected for CO make at the end of the panel's life?-- If I had known that, we would have just investigated a lot more thoroughly. Like I said, if we had 5 lpm in the CO make with a fire smell, well - or fire stink - you would investigate that. We would not have just evaluated the 14 as such.

No. In any event, you know now from the evidence here that Allan Morieson was aware of some signs because he had carried out some investigations with others prior to July last year?-- That is correct, yes.

But you're sure that Allan Morieson didn't raise with you any of those signs that he had been made aware of?-- No, he hadn't, actually.

And you were the person - the underground mining engineer who was, by position description, designated to assist Allan Morieson in his ventilation duties?-- Yes, in certain aspects, yes.

And with respect to the aspect of CO make, you could never assist him without knowing the facts?-- Like I said before, for quite a considerable period in 401, 402 and for a considerable period in 512, I had very little to do with regards Allan putting his information in and printing it out. You know, if I saw the graph, I did - if it came to my attention.

But in any event, relying upon an expected CO make because of a change in mining method would have to be reassessed in light of signs of spontaneous combustion coming out of the panel, wouldn't it?-- I beg your pardon? Could you repeat that?

You couldn't simply rely upon expected CO make because of a change in mining method if you had signs of spontaneous combustion coming out of the panel?-- No. Like I said, if you had signs of a spontaneous combustion - of a stink, as such, you would address that.

And perhaps reassess your estimate that the panel - end of the panel life would result in a CO make of 14 or 12, or whatever litres per minute?-- Yes, you would assess it and you would think about what was happening in the next couple of weeks as it progressed. You would watch it more carefully, yes.

You wouldn't sit back somewhat more relaxed and say any increase in CO make related to the different method of mining?-- You would have both sides of the story to that. If you had a concern, you would - I would try to identify it, if you could. If you couldn't, and you still got a rise in CO make, it still would have to be attributed to the mining system that you were currently using.

And you have mentioned something about the signs of spontaneous combustion, and you mentioned haze, smell, things of that kind, and you have been asked questions, I think, about the Graham's Ratio - ratio of carbon monoxide to oxygen deficiency?-- That's correct, yes.

And it is the fact that the time we are talking about here, back in August last year, you really had no knowledge of or attention to Graham's Ratio inside 512?-- No, I did not. I was aware of the number on the screen but I didn't associate that number with anything in particular, no.

You now know, of course, the way it can be used as a significant indicator potentially of a spontaneous combustion?-- It has been - in the literature it says it can be used, yes.

Now, you are aware of the formula used to calculate Graham's Ratio?-- No, I'm not aware of it. I wasn't aware of it at the time.

You are aware that the way it is done, as I understand it, is to have carbon monoxide divided by a figure, multiplied by nitrogen, minus the oxygen in the reading?-- Minus the oxygen, to give you an oxygen deficiency ratio.

And that formula, as you understand it now, would be fairly critically dependent on the reading of oxygen used to calculate it?-- That is correct.

Because any movement in the oxygen value will significantly effect the ultimate ratio figure achieved?-- That is correct, yes.

Now, the monitoring system inside 512 was capable of analysing the oxygen inside the panel, wasn't it, from samples -----?-- Sorry, is this the sealed panel we are talking about?

No, generally?-- Generally, yes. Generally you've got air flow past every monitoring point which therefore states normal air, you have oxygen.

That's why or that's how, if you like, the Graham's Ratio is able to be calculated on the Unor computer -----?-- On a continuous basis, yes.

Now, there seems to be a prospect that the Unor system was incorrectly reading the oxygen levels; have you heard that suggestion before today?-- I have heard that post the explosion, that's correct, yes.

And do you agree there is some evidence for that proposition in readings taken from the pump room on the surface?-- Beg your pardon, sorry? Could you repeat the question?

Perhaps I should ask you this in sequence: what would you expect to be the oxygen percentage in the normal atmosphere?-- You look at 20.9 as a -----

20.9?-- That's correct, yes.

That's in ordinary air?-- That's in ordinary air, that's correct.

There was a sampling point, wasn't there, in the Unor system in the pump room?-- In the pump room. Yes, there was a pump room -----

Point 14?-- That's correct, yes.

Ideally you would expect point 14 would be sampling oxygen from the ordinary air?-- Fresh air, yes, the freshest air.

You would expect the oxygen from point 14 to read pretty close to what you would expect in ordinary air, to be 20.9?-- I would assume that, yes.

Well, could the witness see - it's part of the SIMTARS report, Your Worship. I think it's volume 2 of the annexures to Exhibit 5?. Could I ask you to turn to - beg your pardon, it's volume 1. If you could turn to appendix - it's 2.1.71 in that volume. That's the data from point 14 pump room?-- That is correct, yes.

And you look at the oxygen values - I should say the data starts on 27 July?-- That is correct, yes.

And I think goes right through until after the explosion?-- That's correct, yes.

In fact the last entry is 10 August, is that so, that series of data?-- That is correct, yes.

You see the oxygen values fairly consistently throughout that whole period are well below what you would expect to be the normal of 20.9; is that so?-- Quite consistently between 20.4 and 20.6, yes, consistently throughout though.

And consistently below what you should have - or would expect to have of 20.9 or thereabouts because this is just the fresh air on the surface?-- That depends on your analyser. Obviously the analyser is consistent.

Consistent -----?-- Consistently between 20.4 and 20.6.

There may be another quite simple explanation for it all, but -----?-- There might be, yes.

One possibility is that the analyser is out of - the calibration on the analyser is inaccurate or in error by a small margin?-- A question I ask is is the analyser able to do it? I don't know.

I don't either?-- No.

If it was able to be calibrated it may well be that it's out of calibration perhaps. That's one explanation?-- That is one explanation, that is correct, yes.

In any event, if that is the explanation you would be having oxygen readings potentially lower than what they should have been throughout the mine?-- Yes, that's right.

And if the analyser is reading fresh air as being less than 20.9 you would expect it to be reading air mixed with other gases low as well?-- I could not comment on that, no.

It's certainly not that simple obviously, but that's a possible scenario?-- Possibility.

If the analyser is out of sync the oxygen levels are being read lower than they should have been?-- I can't comment on that, sorry.

And given the nature of the Graham's Ratio formula, if the oxygen is lower the Graham's Ratio will be lower too, won't it, because the deficiency is not as great?-- I haven't been able to study the Graham's Ratio as such. The deficiency -----

Well, if the bottom line of the equation -----?-- Is smaller you would expect a higher - a higher ratio.

Yes, the bottom level of the equation relates to taking away the amount of oxygen, doesn't it, subtracting from nitrogen the amount of oxygen. So if you can - taking away a smaller amount of oxygen on the reading you will have a higher bottom line and lower ratio?-- Is it your nitrogen minus your

oxygen?

Yes?-- Well -----

Then you would have a lower ratio?-- Then you would have a lower ratio, that is correct.

A lower Graham's Ratio potentially can mask a sign of a spontaneous combustion?-- I've not done the calculations, but .4 to .6 to .9, the .3 difference being the minimum, I don't know what sort of effect that would have on parts per million divided by such a difference of a small factor. That I have not analysed so I can't comment other than that.

We can possibly do that somewhere else, but would you agree that a possible result of an incorrect analysis of the oxygen level could be a lower Graham's Ratio, speaking in very general terms?-- Yes, the absolute value of Graham's Ratio could be lower, that is correct.

If you are looking at a Graham's Ratio in a sign of a heating, whatever the parameters are you could miss it if in the Graham's Ratio is lower than it should be?-- If I recall correctly, when Mr Clair gave me Mr Highton's report yesterday one of the things that he did establish in that report was a base case of Graham's Ratio needed to be identified so you could make that difference - so you could make that judgment.

I think he said, didn't he, that even very small fluctuations in Graham's Ratio would be considered to be significant in terms of detecting a spontaneous combustion?-- He did say that, but he also said to understand the background of - again understanding the background of your mine atmosphere.

While I'm on the point of Graham's Ratio, you were asked questions by Mr Morrison about was it your belief at the time that looking at a Graham's Ratio after a panel had been sealed was virtually useless?-- It was my impression that's correct, yes.

I think you agreed with the suggestion that that was a widely held belief at Moura?-- No, I didn't say that.

Sorry, you said you didn't know what other people believed?-- That's correct, that's what my belief was.

You now know, of course, from reading Mr Highton's report, that's not his opinion?-- It is not his opinion, but I would certainly have a lot of questions to ask him with regards that, yes.

You can see he is a fairly eminent man in the field?-- Yes, that's right, not that I would look to question, but look to get some proper answers.

Certainly, and his opinion expressed in the report tendered here has been that the sampling of the atmosphere behind the sealed panel is valid to determine Graham's Ratio for a period after sealing?-- That is what his opinion is in that report,

that's correct.

The evidence here, of course, indicates that for some hours after the panel was sealed the Graham's Ratio climbed quite rapidly. You know that now, don't you?-- Yes, it did, yes.

But the state of belief at the time at Moura No 2 was that such a ratio climbing significantly into the -----?-- But that would be a natural experience. With Moura's goafs predominantly being a methane existing goaf and the previous panel, the 511 panel, as I said before, within one week of sealing had fully - had just about pressurised. In other words the content of methane coming into that void in the 511 void was quite rapid. Now, I know that methane is lighter than oxygen, it goes to the roof and it can very - it does easily displace oxygen. So, you know, with your rising to the 10 per cent like we saw yesterday in the report - or between five and 10 per cent I should say, that's a point where the monitor was located in the top part of the panel.

I'm not debating with you, I'm simply saying that you now know that Mr Highton sees as significant the rise in Graham's Ratio after sealing inside a panel?-- That's his opinion, yes.

The state of belief at Moura No 2 at the time the panel was sealed was that the Graham's Ratio was virtually meaningless and not to be looked at?-- I cannot comment on that. I can only comment on my own -----

It was your belief?-- It was my belief, that's correct, yes.

On that point of monitoring a sealed area, again looking back on it in hindsight, it's desirable, isn't it, to have a more efficient and representative sampling of a sealed area?-- Yes, yes, a sampling - representative sampling in the panels which had been done on every occasion, yes.

Here you had a large area that was being sealed perhaps not by comparison -----?-- No, not by comparison to other areas in the mine.

But certainly a large area generally, a large goaf area being sealed off?-- We will qualify that; 400 metres by 167 metres.

However we categorise that they were the dimensions of the area you were sealing?-- That was the dimensions, yes.

To monitor the gases inside that sealed area there was one monitor point placed inbye the seals?-- I am led to believe that that's what occurred, yes.

And that was about 20 or so metres inbye of the seal area?-- That is correct, yes.

And I think the belt or No 3 road?-- In the belt road, yes.

And that was designed to sample the atmosphere behind the seals in a panel that was 400 metres long?-- That is what eventuated, yes.

It would be more appropriate, looking back on it now, to have had points further inbye and more of them if that was possible?-- That might be a standard that you could recommend, yes.

And you certainly, having seen the evidence here, you would be prepared to recommend yourself such a proposal?-- Horses for courses. Like I said before, predominantly our goafs fill up with methane but, yes, it would be desirable to have a significant number of points whether it be in just the top return or whether it be in the goaf or whether it be surface boreholes. I mean those sort of issues I think are important issues that could be addressed by this Inquiry.

I want to then move to 22 July which is the day that there was a concern about a high reading taken by Steve Bryon?-- That is correct, yes.

You've been taken through several times now all of these things, but I ask you this: as I understand what you've told us you didn't know that there had been a directive issued by George Mason, the undermanager in charge, to take daily readings after 22 July?-- No, I was not aware of a notice put up to the deputies.

You thought the system had changed after that fright, if you like, on the 22nd, but only to the extent of taking the readings on the weekend and keeping an eye on it?-- That is correct, yes, and I was of that belief the week before the explosion just looking quickly at the blue folder.

So at no stage did you understand before the explosion and after 22 July that the deputies were taking shift by shift readings of all of these relevant points?-- Not on a shift by shift basis, no.

Or even on a daily basis?-- Even on a daily basis. I only acquired that knowledge while I was sitting here in Court.

And, of course, the whole system you now know had been changed to enable a closer monitoring of the CO make?-- A system had been put in place that weekend to watch the - to monitor the CO make.

Which you as the person assisting the ventilation officer had no idea of?-- The weekend - that particular weekend I was aware.

After the weekend, I should -----?-- After that I - I wasn't in the habit of - it wasn't my habit of reading - continually reading through all deputies' reports. I would only read selective ones.

And in fact I think you told us that before Friday the 5th of August there were just no discussions involving yourself or anybody else in your presence about the CO make and what it was doing?-- There was none, no.

And you now know, don't you, that the CO make was increasing?-- Yes. The results taken from the 29th showed a slight increase which I expected, and then the results on Friday the 5th also showed an increase which I expected, and when you looked at the graph on the 5th, discount - not discounting, but looking at - taking out the peaks and troughs in that system the CO make was constantly rising for that week, but that was - that was looking at it on Friday the 5th.

And before that Friday, as you've told us several times now, you had no idea there had been ventilation problems inside 512?-- I was unaware of them, that's correct.

But you were told something about that by Mr Schaus on the Friday morning?-- That's correct, yes.

And that was before you plotted the graph for the 5th, the Friday afternoon?-- That is correct, yes.

Well, didn't that concern you that there had been some ventilation problems inside 512 in terms of CO make?-- No, it didn't cause me any problems. It's nearly - in the design of the ventilation of 512 the stoppings between 12 and cut-through have all got doors constructed in them. Those doors are specifically there so that that bottom triangle, if it does become difficult to ventilate for whatever reason, can be physically rolled up and that's why the inspection route, and then air would pass through that triangle, more air would pass through that triangle. That was the extent of the problem I thought was in that panel.

To be fair to you and to be accurate about it, you even then that Friday morning were not told about smells and re-circulation and layering in No 2 heading?-- No, Albert did say that there was some methane coming up No 2 heading which was a natural part of that triangle being poorly ventilated, but, you know, by physically - we had never put a hole or a door of any type on the top return as such. Since I have found out that Allan actually did. He did put one at 12 cut-through and I think one at 11 to assist the ventilation in that bottom - that very bottom corner and that was quite a sensible idea, I think.

In any event you told us that what you were looking for is some sort of sharp increase in CO make?-- That is correct, yes.

Was it a sharp increase in CO make or a sharp increase in parts per million or both?-- It's a combination of both. The make on the graph as we had the 18 or the 19, was a point of concern for me, but the point of concern when we only rose one part when there was only one fan operation wasn't a concern to me.

WARDEN: Excuse me, Mr Macsporran, unless you are nearly finished we will take a break.

MR MACSPORRAN: I won't be long, but not five minutes.

WARDEN: We will have the morning adjournment now.

THE COURT ADJOURNED AT 11 A.M.

THE COURT RESUMED AT 11.16 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MACSPORRAN: Mr Abrahamse, I was just about to come to the events of 22 July. Before we deal with that, can I take you back very briefly to some evidence you gave this morning and just a moment ago about layering in the No 2 heading?-- That is correct, yes.

I think you told us that Mr Schaus had informed you on the morning of Friday the 5th that there had been a problem in the gases or air coming back up the No 2 heading and it had to be dealt with?-- That is correct, yes.

And that was the first you had learnt of that difficulty with the ventilation inside 512?-- On Friday the 5th, that's correct.

The first you knew of it?-- The first I knew specifically what that problem was.

And were you told when that had happened, when the problem had been encountered inside 512?-- No, it had come to my recollection that when I - while I was on holidays I had contacted Albert about some budget matter that I cannot remember, and he made mention that taking of the sequence on the uphill - they had taken the sequence on the uphill and had some ventilation problems, and then I said to him - I said, "Well, maybe we should, you know, just close that bottom return down, you know, altogether."

So, this is when you were on holidays between 16 June and 11 July?-- That is correct, yes.

Can you now recollect at what stage of your holiday it was that you had the phone call with him, towards the end, the beginning, the middle?-- No, all I remember is that I was at my wife's bedside in hospital.

Does that help you pinpoint when it was in that period?-- No, it doesn't, no.

In any event, it was to do with that same sort of problem. Your spoke more about it, or specifically about it on 5 August, the Friday?-- I asked the question what had happened to the stoppings down the bottom. That was his answer, just that dead triangle - the possibility of the dead triangle and flushing that corner, and that was quite a reasonable -----

I think you have said in evidence that there had been a problem with methane layering in other panels?-- That is - in the - yes, that's correct, yes, I did.

401/402?-- No, not 401/402, did I?

Not sure?-- No. I remember the 5 South.

5 South?-- And the possibility - I don't recollect exactly if methane was coming up No 1 heading in the 4 South level, but I know that No 1 heading in the 4 South level was - had a slower - had a slow velocity down that heading. The stone dust travelling in the 5 South was what I recollect, the ventilation coming back.

Was there a problem in 5 South on that Friday with layering?-- There was - at the end of the day I found out there was some layering in the 520 on the 5th.

That's the stub, I think, off the end of 5 South?-- Down dip, that's correct.

That was dealt with on the 5th by a change in the regulator, was it, the regulators?-- So I was led to believe, yes.

Designed to flush out any build-up of methane?-- That's correct, yes.

Does it strike you as being odd that you weren't called in to deal with or assist in dealing with a layering problem inside 512?-- No, that really was well and truly out of my scope, yes.

You wouldn't consider that to be part of your role in assisting Morieson with ventilation matters, to deal with layering in the heading?-- No, the undermanagers are more than adequate in that field to handle that sort of situation.

It's the case, isn't it, that layering can be a problem in terms of detecting the actual atmosphere, the actual concentration of gas?-- That is correct, yes.

The very fact of layering can mean it misses going into a monitor point or being sampled by, for instance, a Unor system?-- A possibility, yes.

And, of course, that creates a very real problem with safety, doesn't it?-- It's an industrial problem when you work on dips like we do with the high methane quantity in your coal seam, yes.

One way to deal with it, as it was done - you were told it was done in the 520 area, was to alter the ventilation in some form or other to flush out the layering?-- That is correct, yes, in the morning, yes.

Once that's done, it would be advisable, wouldn't it, to investigate the source of the methane creating the layer?-- The source - I'm not sure. You would have to look at the deputies' reports for the night shift or the day shift, whichever it was reported, but you would - the person that would have identified the problem would have also - I assume would have located the source.

Well, you would expect that because it would be - the natural thing to do once you had found layering would be to trace its source?-- Yes.

Because the layering itself can be an indication of a heating?-- Beg your pardon, sorry?

The layering effect, that is, the mixture coming up the roadway at the roof level, can be an indication of a heating further inbye?-- In the 520 panel?

No, no, in any panel. A layering effect can be consistent with a heating taking place inbye of the layer?-- That is one possibility, but methane has - with its relative density being .55, its natural tendency is to find its way to the roof. So, saying that it specifically related to a heating is not absolutely true.

I didn't say that. I said it's a factor that is consistent with a heating occurring inbye?-- No, no, sorry, no.

In any event, if you found layering, you would be keen to identify the source of it so you could deal with it?-- I would, yes. Well, if I was - a deputy would do that, that would be part of his role, yes.

And when I refer to ascertaining the source of it, I don't mean where it's occurring in the roof level, I mean tracing it back to some area?-- That is correct, yes.

And that would be good mining practice, to trace the source of a layering problem?-- That is the role of a safety officer, yes.

And once you had established the source was perhaps quite innocent, the next step you would take would be to flush out the build-up of methane?-- There were a lot of things that could have possibly occurred in 520 panel, yes. I could give a few reasons here myself, but whether I am absolutely correct, I don't know.

As we have established, you weren't told about the layering problem inside 512 specifically until the Friday the 5th?-- That is correct, yes.

It was put to you yesterday that Mr Morieson had successfully flushed the goaf area in 512 on 11 June, I think it was; you remember that?-- Yes, I do remember that, yes.

And that seems to have related to a layering problem at that locality?-- From understanding at the Inquiry, yes, that is what occurred.

Now, if you accept that the following week, 17 June, the same problem occurred at about the same locality - that is, a layering problem - a recirculation problem in the No 2 heading - what would that indicate to you? I know you don't have the full facts-----?-- No, that's right. One of the things is just the fact that the velocity would not be travelling enough - there would not be enough velocity travelling down No 2 heading to physically get right down to the end of the panel.

You associate that problem on 17 June with a slight smell consistent with a heating?-- Sorry, are you putting these assumptions to me now?

Yes?-- Well, like I said, if you had 5 lpm CO make and you had a smell, it should be investigated.

So, are you saying the action you would take is not simply to flush the area again; you would carry out a further investigation to try and locate the source of the smell and layering?-- If a source - if a smell was registered by somebody, that would be the first thing that you would try to do, yes, to identify where that smell was coming from.

And what would a smell of that kind associated with layering mean to you, if anything?-- A smell would indicate that there is a possible heating and layering, indicating to me that the velocity at that point - in the heading where the layering was occurring - was insufficient to take that methane away.

Now, in terms of the action taken to correct such a situation, if you flush it, the idea being to dissipate the build-up of methane; is that so?-- To flush the methane?

Yes?-- That is one - by introducing more into that section, you would create more turbulence to remove the layering from the roof.

As we said earlier, if you have a problem such as layering identified, the difficulty you face is that your Unor monitoring system may not be picking up anywhere near the amount of concentration of methane, and possibly other gases in the goaf; is that so?-- Yes, that's true to say if you had methane travelling the entire 400 metres - that's quite a substantial length. I have not - I haven't been - I haven't faced any of those problems where layering has occurred to extensive lengths, but that's what I would assume.

And you have read Mr Highton's report?-- No, I haven't.

Are you aware of any comments that he makes in the report of what you have heard of it - anything?-- About?

About the difficulty with the layering masking the true atmosphere in a panel?-- The closest I got to Mr Highton's report was with Mr Clair yesterday. I tried to keep those notes and those figures out of my head so that I could be a true witness for what I knew pre the explosion.

I think you have conceded that other gases apart from methane

may be masked in the layering problem. You might have increased carbon monoxide, for instance, in such a layer?-- No. Carbon monoxide is of fairly close relative density to air, so I would expect that general body-----

If carbon monoxide is being given off during a heating process of coal, it would rise, wouldn't it?-- No, carbon monoxide's relative density is roughly the same as air, so it would be a general body. It is not like a layering of methane of .55, or carbon dioxide that is significantly heavier and lays on the floor.

The general body through the process of heating would tend to rise?-- The general atmosphere of the goaf?

Would tend to rise with the heating?-- With heat - with a heating or heat, sorry?

Do you get heat from a heating?-- You can get heat from a heating in an isolated location. Like I said before, we are looking at a goaf that is 400 by 180 metres wide, so - sorry, could you clarify that?

Could you have products of such a heating sitting on the roof of a panel and not being monitored accurately by the Unor system such as 512 had?-- If the velocities were not - were of - if you had low velocities, there is a possibility that you would have build-up, yes, of concentrations in the goaf, yes.

Perhaps whatever the velocity was, if it wasn't sufficient, you could have this build-up?-- There is a possibility of that, yes - a good possibility of that, yes.

We know the velocity at least at times was not sufficient, because there was layering occurring in the No 2 heading in 512?-- From what I understand now there was a possibility of that, but we maintained a quantity of at least 40 cubic metres through the panel, even though it wasn't consistent, which was a - which is a significant quantity that runs through any goaf which has a dimension of 400 metres by 160 metres.

But in spite of that significant air flow, layering was occurring in 512, No 2 heading, wasn't it, from what you have been told?-- From what I have been told, and I assume that by opening up the No 12 stopping and the No 11 stopping that that eliminated that problem. I can't say exactly, because I wasn't aware and I didn't take note of that post - pre the explosion.

All I'm suggesting is that if you have evidence of such layering, it is possible there could be, in addition to that layering of methane, a build-up of a product of a heating in the same way, the velocity not being sufficient to deal with it?-- But your carbon monoxide would be a general body reading, and if it was a general body reading, you would assume that the flow would be enough to carry it throughout the pit. I'm not saying that you wouldn't have large build-ups - possible large build-ups like the example that

Mr Highton gave that where inbye of the stopping he obtained, I think, 4,500 parts just inbye of a stopping - I'm not saying that that's not possible.

No, that's the potential difficulty?-- That's the potential of a heating, yes.

You hadn't read that in Mr Highton's report?-- No, Mr Clair ran that through me yesterday, or the day before.

That's the difficulty, isn't it? It is possible if your ventilation is not accurate, even though apparently the quantity looks adequate - if it is not, in fact, adequate, you can have a build-up which won't be picked up by the Unor system?-- That is possible, yes.

Now, I want to take you back to the information that was being gathered after the 22nd of July. We went through before the fact that you didn't really discuss the CO make after that time until the 5th, I think - the Friday - when you plotted-----?-- There were a number of occasions when I plotted it. The first occasion was on the Monday, when I looked at the-----

The 25th?-- The 25th - Monday the 25th, that's correct.

And the 29th?-- Not on - I plotted the result of the 29th on the 1st.

That's the week you came back?-- That's the week I came back, that is correct, and there was a slight rise in the CO make, yes.

Then you plotted it finally on the 5th, I think?-- That's correct, yes.

And discussed with Morieson the results?-- No, I did not discuss the results with Mr Morieson.

Didn't he return to work on the 5th?-- He returned to work on the 5th, yes, that's correct.

In any event, at no stage between the 29th and the 5th did you plot any graph for CO make?-- Sorry, I beg your pardon?

At no stage between the 29th - or 1 August and the 5th did you plot any further graph of the CO make?-- No, I did not, no.

Because you didn't know the deputies were still taking readings shift by shift?-- That is correct. I said in previous statements that I saw this log in the blue folder, opened it, saw that there were readings just one day past the day I was there and then closed the log again.

All right. Could the witness see Exhibit - I think it is 152, Your Worship?

I think it is a synopsis of evidence, is it? Is that the one?-- I've not seen this before.

Yeah, 152, is that the one you have got. Have you got the tabulation there as part of that exhibit?-- I've got a couple of graphs - yes, a make for the 512 panel.

There is a table there that talks about or records in log form, similar to the way you were doing it for the CO make, information by way of dates, deputy, shift, and all of the details you had required to plot a CO make; is that so?-- Yes, I am aware of this. This was made up when we found out about the log, yes.

Yes. And this table uses a Maihak reading to correspond with a Drager reading taken by the deputies on each of those shifts; is that so?-- That is correct, yes.

And then the final column, or the second last column records the actual make calculated using the deputies' Drager and obviously the deputies' velocity readings; is that so?-- I'm not aware of that. Is it the Maihak or the deputies'?

It says CO make Drager litres per minute?-- Oh, beg your pardon, CO make, Drager.

Yes. It apparently seems to relate to calculation of CO make using the Drager reading?-- Using the deputies' reports, yes.

And figures are set out from 23 July through to 6 August?-- That is correct, yes.

Now, you haven't at any stage - or have you - plotted a graph of those readings through that period?-- Pre or post?

Post?-- No, I have not.

You said that what you were concerned to look for was a sharp increase in both parts per million and CO make?-- That is correct, yes.

That's to alert you to the presence of - a possible presence of spontaneous combustion?-- A possible problem, yes.

And a CO make in litres per minute would be more reliable, because it takes into account velocity as well as parts per million, doesn't it?-- That is correct.

You could have a high parts per million with a low velocity that may give you a slightly lower make?-- You would get a lower make, yes, that's right, or incorrect make.

So, the advantage of the litres per minute or CO make figure is that it takes into account the variable of velocity or air flow inside the panel?-- That is the function of the CO make formula, that is correct, yes.

Which makes it an accurate, or more accurate measure of what's going on inside a panel than simply parts per million; is that so?-- That's what was - the system that was used at Moura, yes.

That's why the system changed, apparently, we are told, in 1987 from placing reliance on parts per million CO to a calculation of CO make in litres per minute?-- I'm led to believe that that's correct.

Could I ask you to have a look at this document, please?-- Am I finished with this?

Certainly. You might just leave that with you for the moment, but certainly put it to one side. I want you to look at that document. Firstly, I want you to look at the front page which is meant to indicate the source of the data that's used as part of that exhibit, or what is the intended exhibit. Do you see that?-- Yes, I do.

It might be a little hard to read across without the lines, but can I suggest to you - if you don't agree, please tell me - that what this tabulation uses is a combination of information which is set out on that sheet; is that so?-- There is a heck of a lot of information on this sheet, yes.

It starts from 28 February 1994 and goes through until 6 August 1994?-- That is correct, yes.

And records readings of parts per million, carbon monoxide; is that so?-- Parts per million, yes.

Velocity?-- Methane, velocity, yes.

No, methane reading, and then the next column is velocity in metres per second?-- That's correct.

Then air quantity in cubic metres per second?-- Are we going right across or are you just jumping-----

I am going from left to right, starting with parts per million, ending up with CO make litres per minute?-- Yes, you have 512 top return and bottom return. Which one are you looking at?

Straight across the sheet?-- Yes, but the top return or the bottom return columns?

It doesn't matter. They are both recorded, aren't they - both returns are recorded?-- Yes, they are.

As they would be to make a calculation of CO make; is that right?-- It is just a little bit confusing, the table.

Well, I'll go back to the left then. 28 February you have bottom return readings of parts per million CO?-- That is correct.

Percentage methane?-- That's correct.

Velocity metres per second?-- That's correct.

Top return parts per million CO?-- That's correct.

Percentage methane?-- Correct.

Volume metres per second?-- Correct.

Air quantity cubic metres per second?-- Correct. For a matter of interest, which one does that relate to? Which velocity?

Well, in any event the calculation results in a litres per minute as calculated, doesn't it?-- That is the next column, yes.

And then finally litres per minute of make as reported?-- That is what it has on the columns, yes, yes.

On the right-hand side of the page going across again from left to right you have the source of the data that's used on the left; is that right?-- That is correct, yes.

And there is the spread sheets referred to that you had compiled as a log, that's the spread sheet FB700/010?-- That's correct.

Then the next column is top return gas data source?-- Correct.

And that relates to Unor daily average?-- That's correct, yes.

Then Unor shift average moving down the column?-- Daily and shift, that's correct, yes.

That whole column of top return gas data is compiled using the Unor system with either daily or shift averages?-- That is what it says, yes.

The velocity source commences using the spread sheet that you and Morieson had contact with?-- That's correct.

And then after 22 July, I think it is, uses the information from the deputies' reports which are numbered?-- That is correct. Three numbers - sorry, all number reports, yes.

So for the period 22 or 23 July through to 6 August the source of the information has been the Unor system with daily or shift averages and the deputies' reports for velocities?-- From date did you say?

I think it's around about 22 or 23 July?-- The first shift

average is the 23rd.

And then those shift averages are used from that point right through until 6 August?-- That is correct.

Except for the last one, I should add, which is 6 August at the time 2030 which is 8.30 in the evening on the Saturday night?-- That is correct, yes.

Which is the reading Mr Tuffs took?-- Yes.

Having been taken at 8.30 it apparently is possible to ascertain the Unor point value at about that time?-- Yes, would be, yes.

So that actual point value is being used as opposed to the other shift averages on the Unor. Do you understand that?-- I understand that, yes.

That's the first sheet. Now, the next sheet is a plotting of some data and you see that the graph really is a plotting of information from, in effect, the start of extraction in late April 1994 through to 6 August?-- That is the dates, yes.

You see from the legend that - I think it's the orange -----?-- Can you just look at something, thank you, before you go on?

Yes?-- Yes?

Were you checking the date of extraction, were you?-- Yes.

29 April or thereabouts?-- That's correct, yes.

It starts from there and goes through until 6 August; is that so?-- That is correct, yes.

Now, the orange plots that you see refer to the CO make said to be BHP as at 5 August 1994?-- Sorry, you are going to have to bear with me for a while here. My colours are not the best. Go on.

The orange one you see there shows -----?-- With the square in the middle?

Yep, the orange one, the squares?-- Yes.

Goes through from around about 29 April through to 6 August showing a generally upward trend; is that so?-- That is correct, yes.

There are peaks and troughs, but would you agree that generally you could put a straight line which would move upwards and to your right for the BHP information up to 5 August?-- That is correct, yes.

You say, I suppose - or have said that that upward trend was not sharp so as to cause you alarm in terms of the CO make rate of increase?-- This was one of our best production

panels that we ever had. I mean we averaged - the data that's been given to the inspectors indicated we produced on average over that time 785 tonnes per shift - per unit shift that we had in there. I mean I only had ever scheduled 620 maximum. I mean there were times - months that we had 800 tonnes and in the last month 900 tonnes a unit shift, so we were producing at a very good rate, at the best rate that we had. I just wanted to make that clear.

Does that have relevance in terms of the slope of the graph though?-- In context to the extraction system that we had I think it does, yes.

Are you going back to the proposition that the method of mining explains the increase in CO make?-- That is correct, yes.

But you know now that's been somewhat discredited, that theory, hasn't it, by Mr Highton in his report?-- I've not read that, but that's his opinion.

In any event, you see then the green line, if you like, is in fact the line that's put through those orange plottings?-- Righto, yes.

In other words the green line is the straight line that best fits the peaks and troughs of the BHP information for CO make?-- Can I ask a question?

Sorry, I had that wrong myself. I apologise. The green line refers to all data which is the blue plottings, shows the slope of the increase related to the blue plottings, right?-- Related to the blue?

Yes?-- Does it, yeah.

The next one is the blue plottings, do you see that?-- Yes, I do, yes. With the blue box?

Yes, and that is a plotting from 29 April through to 6 August of all the data assembled?-- Righto, okay, yes.

And as we established before it uses the deputies' reports from 23 July through to 6 August and the velocities recorded by them?-- Well, I'll take your word for it, yes.

And uses the Unor system shift averages for those same deputies shifts?-- Yes, I can't argue with you, yes.

What do you say about the rate of increase as plotted using that information, the rate of increase of the CO make using that information?-- It's just - it's nearly the same realistically.

Are you looking at the blue plottings at the end of the period?-- No - well, the only difference being the very last part of that graph.

Well, the last part of that graph is the period -----?-- Is

between, say, 6 August, and if that's a week period I'd say the last three days to be precise. Otherwise I'd say that they were fairly well - fairly similar.

Even you would concede, would you, that the three days or so before 6 August the trend went markedly up?-- Yes, I would, yes.

And in fact if you look at the whole period from 23 July through to 6 August that is the trend, isn't it?-- There is a very stable flattening trend which we identified and then from that mid week it climbed, yes.

Now, such a graph was never plotted, was it?-- No, it wasn't.

Easier to look back perhaps, but looking at that what would you surmise was happening inside 512 as at 6 August?-- At 6 August past the 16 mark you would want to look at it and investigate it. There was a rise.

Well, that is even indicative of what you say you were looking for, the sharp increase?-- Yes. My understanding of a sharp increase as made reference to the 5 North was the vertical line which is on 6 August, a really sharp - I mean that's sharp.

This is sharp, isn't it?-- That line would be as sharp as, say, between - when that high reading was obtained on 11 June to identify that peak as well. Yeah, I'm not saying that it's not sharp, but I'm trying to put it into context.

It's certainly a matter that had you seen it on the 6th you would have carried out further investigations; is that so?-- We would have looked into it, I'm sure.

It would have been a matter of some considerable concern?-- Yes, the 16 litres itself is - to look into.

If you look at the next sheet you will see that's an enlargement, if you like, of the period, 23 July through to 8 August. Do you see that?-- That's correct, yes.

And you see the red line is the actual data that had been plotted as at 5 August?-- That's the red line with the red box in it?

Yes. Now firstly do you agree that shows an upward trend?-- Yes, it does, yes.

A continuing upward trend?-- A continual upward trend, yes.

As early as 23 July; is that right?-- Yes, it is. That's right, we were in extraction mode at that time.

Those were the actual graphs that you had plotted, aren't they?-- That is correct, yes.

30 July or thereabouts and then finally 5 August. That's the information you had and had used?-- That is correct, yes.

Then above that you have the blue lines again; is that so?-- That is correct, yes.

That refers to the actual deputies' reports for velocity and the Unor shift averages?-- That is correct, yes.

Which shows a fairly steep increase in CO make from the 23rd - well, certainly from 2 August on, doesn't it?-- From 2 August on, that's correct, yes.

Culminating in Tuffs' reading of - on the evening of the 6th at about 25 or thereabouts litres per minute?-- I would just like to make one comment on the Mr Tuffs' reading.

Yes?-- That was the very last recorded reading of that section and that is why I put that into the log document, being the very last.

It was after sealing had commenced?-- No, that was post sealing.

This is 8.30 on the Saturday night?-- I'm saying the log that I had produced with the 16 -----

The log you produced was post sealing?-- Was post sealing and Mr Tuffs' reading was the last reading that I was aware of and that's why I used that particular result.

You can see the trend though is borne out by Tuffs' deputy's report 3775 which is in excess of 20 lpm, comes back on 3776 to about 18 or 17.6 litres per minute or thereabouts and goes up to Tuffs' 25?-- Tuffs at 25?

Yes?-- Tuffs was 16.66.

Even ignoring Tuffs, the trend you've got -----?-- That makes a big difference to that graph, the appearance of that graph.

Well, if you take then the line of best fit which is the green line for that same graph, do you have that there?-- Yes, I can see that, the single line, yes.

That shows a fairly significant increasing trend, doesn't it?-- It shows an increasing trend, yes.

You see the Tuffs' reading at 6 August, 2030 which is 8.30 Saturday night?-- Sorry, where are you? On the front sheet, are you?

Yes, the front sheet, just the data sheet?-- The very last reading.

Can you see the CO parts per million 512 top return is 10.5; is that right?-- Just one moment.

The very last entry, Mr Abrahamse?-- Sorry, the 10 parts that you obtained in the top return is a point value from the Unor.

Tuffs took his reading at 8.30 Saturday night, didn't he?-- That is correct, and he recorded a 7 ppm. That's what I have logged on -----

That's how you get 16?-- That is correct, yes.

But if you take the Unor reading for the same time or thereabouts the Unor was reading 10.5 ppm?-- At a velocity of 1.81.

Yes, and apparently that calculates out to 25 lpm?-- So we will use Mr Tuffs' spot reading and the Unor value, not the actual value that he measured underground; is that correct?

Yes, to be consistent with the information supplied here. Anyway you have some problem with that, do you?-- I do, yes.

Do you see that the green line which is the line of best fit up to 3774 shows an increasing trend upward?-- Yes, I do.

And a trend upward to cause you some concern?-- Yes, it would, yes.

Had you seen it?-- Had I seen it? Yes.

Your Worship, I tender that series of documents.

WARDEN: Admitted and marked Exhibit 158.

ADMITTED AND MARKED "EXHIBIT 158"

MR MORRISON: Can I just mention one thing? I don't object to its tender, obviously someone is going to prove this in due course and tell us about it, but I ask our learned friend Mr MacSporran clear up at some stage before we talk to the person who produced the document the source for the shift average? It's been described as a Unor shift average. To my knowledge the Unor doesn't give you a shift average. So what I'm confused about is on that schedule you will notice times inserted which suggest that the spot reading for Unor might have been taken at the times indicated in the second column which seem to be start of shift times. I don't know if that's right or not. If it's someone who has just added up a lot of values can we know that? If so, which values so we can make some sense of at least that aspect of it. In due course, I don't need it right now.

MR MACSPORRAN: I am happy to do that. It will be proved in due course obviously. Mr Abrahamse, can I take you quickly to a couple of matters? Can I ask you generally how you would describe your relationship with the inspectorate?-- I thought I had - being a nice small team I think I had the luxury of, being a fairly sort of recent engineer at a mine site, to be able to have some association with the inspectorate, Mr Walker in particular. I knew Mr McMaster. Mr Mackie to a lesser degree. I knew of him, but to a lesser degree.

But you had a good working relationship with them?-- Yes, I did.

There was never a problem approaching them about any concern you had or matter you wanted clarified?-- No, no. We got on very well, I think. In my view we did.

Now, you have been asked some questions about the time when the documents were taken by the Inspectorate after the incident?-- That is correct, yes.

Now, what happened was this, wasn't it, that the incident team, which included most of the relevant inspectors, came to the mine site and requested they be given all relevant information about the incident?-- They requested a mass of information, that is correct.

But they asked to be produced to them all relevant information dealing with the incident and running of the mine generally?-- That's correct, yes.

I mean, that's to be distinguished from the Inspectorate coming to the mine site and conducting a search of the premises and seizing documents?-- No, they did not conduct a search -----

Search and seize?-- Search and seize operation, no.

Neither would you have expected them to have done that?-- No, I would not.

The relationship was such that they came there and requested the information and were given quantities of information?-- Beyond the realms of what people can sift through, yes.

And at no stage that you saw was there any search or inspection carried out by the Inspectorate of documents at the site?-- No, there was no search. Alan and Mike had set themselves up in the training room conducting - while Mike was conducting interviews there were - while conducting interviews with personnel, questions would be asked and then sources of information would be requested, and that was sort of an ongoing - on an ongoing basis for quite a considerable period of time, and that information was given - the request was given from the Department to Albert, the manager, and he then in turn delegated that information to the rest of his departments. I was one of the delegated people.

Just a final point: did you ever receive any training or refresher training at No 2 dealing with the signs of spontaneous combustion generally?-- Not that I can recall, not on specifically spontaneous combustion.

I think you mentioned having a library that you put together yourself with various publications?-- Yes, I had a bookshelf with some books.

Was that the extent; it was self-education, if you like, about this phenomenon?-- It was self-education about all aspects,

conveyor belts, mining systems, pillar design and so on.

As opposed to a training program run at the mine for personnel?-- That is correct, yes.

Thank you, Your Worship.

CROSS-EXAMINATION:

MR MARTIN: Mr Abrahamse, you, firstly, were a graduate engineer at BHP at Moura?-- That is correct, yes.

And you then joined the management team?-- That is correct, yes.

When?-- When?

Yes, please?-- Well, basically when you join the graduate team when I started at BHP Australia Coal, you are basically an official at that stage of your career.

All right. Well, is it fair for me to say that you were part of the management team from the time you first got there as a graduate engineer?-- I considered myself as, yes.

But certainly there would be no argument about it from the time you had fulfilled your graduate period and were put on, as it were, permanent staff as mining engineer?-- My title came as - if I got any letters from Brisbane or anywhere else it had graduate engineer on there, but being a little bit older than a lot of graduate engineers, I just accepted the responsibility of being part of the management team.

So, before the explosion you had, what, 18 months to two years or what period of time as part of management?-- Well, from the beginning of my graduate scheme.

Just what date approximately?-- I started '91 - February '92 I started at Moura.

After you received your degree from Wollongong, did you become a member of a professional institute particularly relating to engineering?-- Yes, as a student I joined the Australian Institute of Mining and Metallurgy and I remained as a student for some significant time after that until I joined BHP.

And did you remain a member of a professional institute after you joined BHP?-- I still currently am, that is correct.

Did you receive periodic literature?-- On a monthly basis, yes.

Relating to coal mining - some relating to coal mining?-- Related to mining would be a more apt term. It was metal, coal and -----

Some relating to coal mining?-- Some related to coal mining, that's correct.

Some relating to spontaneous combustion?-- I can't recall any specific papers. There was an Australian coal journal that used to come to the - to No 2 underground and there was a specific paper in that with regards spontaneous combustion, yes.

Before August 1994?-- That is correct, yes.

And the literature received from your professional institute, did that contain articles on gas and analyses of gas?-- Sorry, sir, there were a lot of papers in that. I never professed - I will not profess to have read every single one of those papers, but there were many different types of papers and I can't - I wouldn't be able to say exactly if they were gas related or spontaneous combustion related - in the AUSIMM magazines.

Before August 1994 had you done some further training in relation to a position in the mining industry?-- The extra training - the only extra training I did do was the two week preliminary training to become a Mines Rescue member, and maintained that right up until the explosion.

Were you not undertaking studies in connection with getting your second class mine manager's certificate?-- Yes, yes, I conducted them on my - at my own steam, yes.

So, what you said just a moment before that is not correct?-- I have still not obtained my second class ticket as such.

The question I asked you is whether you undertook any studies?-- There were no formalised studies, no. They were studies on my own bat with my own experience.

With a view to obtaining a second class mine manager's certificate?-- In the hope to, yes.

When did you commence that?-- The actual studies or the - the studies would have been an ongoing thing while I was at Moura. Albert gave me a little bit of time off between 30 May and 6 June.

1994?-- 1994. On 6 June 1994, a Monday, I sat for my written second class underground ticket.

Yes, you did, and you passed?-- Yes, I did.

And before that you had a curriculum of the course?-- No, I did not, no. The written exam predominantly was to be able to learn the Coal Mining Act back to front and inside out and understand it, so there were only really two books and a substantial number of past exam papers to identify what sort of questions I would be - that I would be getting.

What books were they?-- The Coal Mining Act.

You said two books?-- There is a General Rules for Mines, coal mining. The second class ticket in Queensland enables you to sit for an open-cut and an underground second class certificate of competency. You have to have experience in both. I had only one year at the open-cut and then the remainder of my experience was at the underground and I was trying for both.

In your study for that exam you say you studied the Queensland Coal Mining Act or Coal Mine Act of 1925 as amended?-- That is correct, yes.

And as well the General and Special Rules Relating to Underground Coal Mines?-- Specifically for open-cuts, that's right.

Open-cuts only?-- Yes, the book was a making of rules for open-cut.

But attached and emerging out of the Coal Mining Act of 1925 as amended there are several sets of rules, aren't there, not only relating to open-cut, but special rules relating to underground mines and general rules relating to underground mines?-- That is correct, yes.

And you studied those?-- If I wanted to pass the exam, yes.

But you did study them?-- I did study them, yes.

Now, within the Act and the Rules you studied there was a lot of space or sections given over to gas and ventilation?-- That is correct.

So, when you were giving evidence yesterday or the day before or perhaps even today, it wasn't correct to say that you were ignorant of mine gases, underground mine gases?-- No, I'm not totally ignorant of mine gases, no.

You are certainly not now, but even by 7 August 1994 you weren't?-- No, my Mines Rescue training would also have assisted me in mine gases in 1992.

Did you get material from TAFE for the purposes of that course and that examination?-- No, I did not.

Have you achieved in New South Wales any statutory position?-- No, I have not.

Do you know of a contractor called Abignano, A-B-I-G-N-A-N-O, or J Gardner Contractors?-- No, I'm sorry, I am not aware of them.

Did you ever work on the Blackall tunnel around Maroochydore?-- No, no, sorry, I didn't. I worked on the Bondi sewerage tunnel but not -----

You know where Maroochydore is?-- Yes, I do, lovely place.

I am not talking about Bondi. By the time you finished your initial course, loosely called, at Mines Rescue in 1992, you knew, didn't you, from what you had learned, that 10 lpm carbon monoxide make was falling into the area of concern?-- Yes, that was what was in the Mackenzie-Wood book.

You also knew from that education that 20 lpm was potentially dangerous?-- That is correct, yes.

I just might deal with Exhibit 127 for a moment which is the Moura No 2 log alarm - alarm log, I should say. If you just look at that, if you wouldn't mind. I want you to ignore - well, I will just take you to it briefly. It speaks for itself, doesn't it? It is the location of a monitor point, time of alarm, time acknowledged, alarm description and so forth, reading across the top?-- That is correct, yes.

And others as well. Now, the new computer was installed, as I understand, on 27 July, so those first six entries relate to the day of installation. They are all on 27 July?-- 27 July, yes.

Coming to the next four items, they relate to the 2nd, 3rd, 5th and 6th, don't they, of August?-- That is correct, yes.

Now, you weren't there on the 6th, as I understand your evidence, but you were there on the 2nd, 3rd and 5th?-- That is correct, yes.

And on at least one of those days you weren't underground at all?-- That is correct, yes.

Well, can you - the 2nd did you go underground, just remind me, on 2 August? That's a Tuesday, I think?-- Tuesday. The 1st I did and the 4th.

I think the 4th you did?-- That's correct.

So, you were there aboveground on the 2nd, 3rd and 5th?-- That is correct, yes.

Now, I take it that you didn't hear alarms from the Unor system running for something in the vicinity of approximately three hours on the Monday?-- No, I can't recall.

I am sorry, on the Tuesday, I should say, that's the 2nd?-- No, sorry, I can't recall that.

Your office was really quite close to the alarm siren?-- I would have heard it.

You certainly would have heard it?-- I would have heard something, yes.

And similarly on the 3rd - that's at night-time, you may not have been on shift at all - sorry, that's not night-time, it's during the middle of the day. Were you on shift then?-- Day shift, yes.

You heard no continuous alarm - siren, I should say?-- Not that I can recall.

Well, you would recall it, wouldn't you?-- Not that I can recall, no.

Well, you would recall, wouldn't you, if there was continuous interference with your thought processes?-- For how long?

For however long you were on shift after 11.09 on 3 August, about four hours probably?-- No, I cannot recall.

But you would recall if you had an uninterrupted siren interfering with what you were doing. It is intolerable, isn't it?-- Yes, the siren is intolerable, yes.

It is meant to be. Similarly, on the 5th there is an alarm for something like an hour or so, or less than an hour, some 16 minutes. You don't recall that?-- No, I do not recall that.

Now, were you familiar at all with the Unor alarm system, whether it be by way of alarm on the Unor or siren attached to the Unor?-- In my time at the No 2 underground I had never accepted any alarms.

I am not suggesting you did?-- No, but - and, therefore, I didn't - I would have heard the alarm, as I did on the day of the second explosion. It is very piercing, but I hadn't accepted any at all.

See, what I am suggesting to you is that in the system which existed, you being part of management, that if the siren were operative, that is, the siren operative and alarming with an alarm on the Unor, you must have heard it?-- Yeah, I would have, you couldn't miss it, but -----

Doesn't that suggest to you that the alarm wasn't set or reset - siren, that is, set or reset if it was receiving an alarm on the Unor?-- If it was receiving an alarm on the Unor -----

Well, it was-----?-- I can't remember.

The document says it was - seeing the document, it is true?-- Sorry, I'm not much help to you.

What, to you, as an ordinary, every day member of the community does a siren mean? Danger?-- Yes. Not just danger, but something to be - it is a forewarning.

To do something?-- To do something. There were a number of alarms. We had installed - yeah.

Okay. You know, don't you, just from your every day contact with the average mine and average deputy, that they're good fellows, a bit rough and ready and not a lot of education?-- No, sorry, I don't hold that point of view. A lot of the fellows are educated in a lot of other aspects, other than technical aspects, but-----

Okay?-- There were a lot of good craftsmen and good tradesmen that were miners.

Occupying a mining position from another trade, that's what you are saying? They previously did something else?-- That's correct, yes.

For a man who didn't have, say, as much information or education in relation to, say, mine gases or spontaneous combustion and things of that description as management at Moura was supposed to have, the siren, I suggest to you, would at least put them on notice to inquire as to what was going on?-- That's what its intention would have been, yes.

To make people who may otherwise have been ignorant get into a state of alarm and start asking about their well being; that must fellow?-- Whether you be ignorant or educated, it is a good warning.

I understood you to tell my learned friends to my right that a lot of the position descriptions were written by you?-- That is correct, yes - or put together by me, yes.

How does one "put together" a position description? Did you just sit there in your office and say, "Well, what should this job entail?"?-- No.

All right. Tell us, please?-- Part of the BHP system - there is a performance - an annual performance review that outlines individuals' responsibilities in conducting - one of the tasks in putting the position descriptions together, I would grab the respective person, ask them if they would bring that personal information-----

To you?-- Not just to me, and we would sit down and we drafted it together. I never sat and thought up all those lovely things. It was on a consultative basis.

You would have been still writing many of them even now if you put that amount of time into it. It would have taken a

massive amount of time?-- The QA system - to introduce a QA - so it doesn't fool anybody, to introduce a QA system does take a considerable period of time and there is considerable effort on behalf of a lot of people.

When you came to Moura No 2, or at any time thereafter before 7 August 1994, it is the case, isn't it, that nobody in management thought - I withdraw the "thought" - gave you any instruction on the importance of the Unor or how it worked?-- That is correct. I was not shown how to use the Unor, other than by Allan Morieson.

Now, we know in this Court that there existed at BHP No 2 Mine a manual or a brochure on the Unor system. It was held up in Court a couple of days or a few days ago, if my memory serves me correctly?-- I remember that, yes.

Where is it? Is it capable of being produced to this Inquiry?-- At this Inquiry?

MR MORRISON: Absolutely. I can produce it right now. We will do it now.

MR MARTIN: Thank you.

Moura No 2 Computer Operator's Manual, Maihak Australia. Before it was held up in Court the other day, had you seen it?-- No, I had not.

Do you know whether - have you looked at it since it was held up in Court?-- No, I have not.

I tender that manual.

Do you know whether it relates to the computer that existed before 27 July, or after 27 July?-- I would assume it would be the touch screen. Like I said, I haven't looked at it, but I assume it would be the touch screen.

I haven't looked at it either. In the Unor room was there anywhere that that document - that manual could have been kept? It wasn't kept anywhere visible to you, at least, in the Unor room?-- Not that I was aware of, no.

And nowhere that you were aware of in the offices of any of Mr Schaus, Mason, undermanagers?-- Sorry, I am not aware-----

You weren't aware of-----?-- No, I wasn't aware, no.

Am I right in suggesting this to you, I think: that you received no instruction, except from Mr Morieson, about the Unor system?-- That is correct. You only needed to be shown-----

We can take it that nobody else at the mine did in inferior positions to you, such as deputy or miner, receive any course of instruction either - that you are aware of - on the Unor?-- I don't know if that's a correct statement to make, because-----

Well, do you know it is not a correct statement to make?-- It is not a correct statement to make.

Well, say so?-- Because there were deputies at No 2 underground that were able to use that screen.

And are you presuming then that they received some course of instruction that you didn't receive?-- You didn't need a classroom-trained instruction. It was fairly easy - on my behalf, anyway - to be able to utilise that screen - to get information out of that. It is an assumption on my behalf that there were other people-----

Who could use it?-- -----that could use it, specifically the deputies.

And you, of course, are a graduate engineer and know all about computers from university; that's the case, isn't it?-- No, I only started learning about computers when I joined BHP Australia Coal.

Didn't you have computer facilities at Wollongong University?-- There were computer facilities at Wollongong, but they operated on the main frame when I was there. PC's were a very new thing at that stage and I had very little exposure to that.

Coming back to my question of a few minutes ago, you cannot tell this Inquiry of any system of instruction that was laid down by management, of which you were part, for instruction on the Unor to rank and file deputies or miners?-- There was no official program as such.

No program, I suggest?-- No program.

Thank you. And similarly, I suggest, in relation to that old-fashion piece of equipment called the gas chromatograph, which was also in the Unor room. There was no system of instruction laid down by management for usage on the gas chromatograph, was there?-- There were individuals that-----

Please answer it. Please answer my question?-----

MR MORRISON: You should give him a chance.

MR MARTIN: He is not answering the question.

WITNESS: There were people specialised to be able to use that instrument and I was shown that instrument at some stage of the game, but if you do not use that instrument on a regular basis - and that would nearly be a daily basis - it is a far too sophisticated and temperamental machine to just jump on whenever you wanted to.

MR MARTIN: Let me now come back to my question of some minutes ago. There was no laid-down system by management - BHP - for usage of the chromatograph, was there?-- Can you define "usage", please?

You do speak English, don't you?-- I do speak English.

What does "usage" mean to you as an engineer?-- Are you looking for set procedures?

Yes?-- There were set - there was training on how to use the gas chromatograph.

Right, pause there. What training?-- Training that was conducted by Mr Robertson with his electricians and Mr Selff. That system, whether or not - the fact is it wasn't documented, but there was a system in place where he was training people to use the chromatograph - the very specialised piece of equipment.

What training? What was the course? What did he train? You are management?-- He showed them how to use and calibrate the system and send spans on a daily basis to the SIMTARS group.

All right. No system written or otherwise as to whether mine atmosphere from a particular panel should be tested on the gas chromatograph?-- That is correct.

And all we have heard in this Inquiry so far, apart from Mr McCamley on back shifts occasionally using it for that purpose - all we have heard so far is that it was tested and kept in operational order so that it could be used?-- That is my understanding at this point in time, yes.

Just coming back to the Unor for a moment: it had a facility for analysis for hydrogen. If you personally don't know, say so?-- No, I'm not aware of that, no.

You weren't any stranger to the Unor before August 1994, were you. You frequently saw it, you frequently used it?-- I frequently saw it. I used it on occasions.

All right. So, when you saw it and occasionally used it, you saw on the panel running across the top the words "Graham's Ratio"?-- As the last column, yes.

Did that not prompt you at any time during your period at Moura before August 1994 to inquire about Graham's Ratio?-- In hindsight it should have, but I didn't at the time, no.

Before August 1994 had you ever heard of the ratio between carbon monoxide and carbon dioxide?-- No, I had not, no.

Have you heard of it since?-- At this Inquiry I have heard it raised a number of times.

Before this Inquiry and after the explosion?-- No, I had not - I had not looked into it then.

This is going off the subject for a little, but who at the mine in management - you're in a fairly senior position - you are a mine engineer - who at the mine, other than you, would have known such things as the relationship of hydrogen,

Graham's Ratio, CO, CO2 ratio? Who?-- I don't honestly know.

Do you think anybody did?-- I can't answer for anyone else at this point in time.

Of course you can't. But nonetheless, you and several others comprised management of that mine which blew up on 7 August 1994; that's the case, isn't it?-- That is the case.

Do you understand the gas chromatograph and indeed the Unor with its new computer system to be the latest state of the art scientific techniques for determining what's happening inside a panel in terms of its atmosphere?-- Yes, I assume that is what we were using.

Do you know whether the gas chromatograph was fitted with or equipped or had built into it the SIMTARS CAMGAS system?-- Yes, I was aware of that, yes.

Before the explosion?-- Before the explosion, that's correct, yes.

And what did you think or know about that system?-- Very briefly-----

What was it's purpose?-- Very briefly, Col - in '92 when Col was installing that system, he just explained to me that that would give us the ability to send the information from the mine site to Brisbane.

But, in any case, had the gas chromatograph been used before the explosion in the days leading up to or indeed even the weeks leading up to the explosion, it had the capacity, if there was somebody trained at the mine, to interpret what it did - to tell the mine - the mine management a variety of things, including whether there was a heating?-- It possibly could if it identified the hydrogen and hydrocarbons, for sure.

All right. But it did have that capacity to identify hydrocarbons?-- That's what - its main function was to be able to identify that - the hydrogen and hydrocarbons.

And it could have told a trained person, if used, or would have told if used, whether or not there was a heating and, if there was a heating, how hot it was?-- Whether there would be a possible heating, if those products were identified, I'm not sure if - to be able to specifically say how hot it was.

All right?-- I'm not qualified to answer that.

No? You're not, you say. And you know the SIMTARS system, if there was any doubt about what the gas chromatograph was reading, or indeed if there was any doubt about what the Unor was producing, there was a 24 hour a day scientist at SIMTARS who could have given all of the assistance that was necessary over the telephone virtually instantly?-- I understand that to be the system, yes.

Was there, to your knowledge, any type of manual or brochure on the gas chromatograph before 7 August - at Moura No 2?-- Not that I can recall.

You have personally never seen one?-- I have not seen one, no.

Well, since 7 August 1994, are you aware of a manual or brochure at Moura No 2 on the gas chromatograph?-- Of the gas chromatograph system?

Yes?-- Yes.

Where is it?-- Where is it?

Yes?-- I think there's a set of green folders next to the gentleman behind you on a course that they run.

But that was at Moura No 2?-- No, that - you said post explosion, I've seen that here.

Have you seen it post explosion at Moura No 2?-- Not post explosion at Moura No 2, no.

You knew before 7 August 1994 that the Drager had a known error factor?-- I did not know the factor, no.

But you knew it had a known error factor, I'm not asking about the percentage?-- It had - it had possible limitations as - from Mines Rescue you were able to - you would identify limitations of different pieces of equipment.

Can you agree with me or not that you knew that it had a known error factor?-- No, I cannot agree with you on that.

Well, you knew from Mines Rescue that it had limitations?-- That is correct.

What do you say they were?-- The use of the 21/31 as a piece of equipment and the method of sampling and the integrity of the sample tube that you were using with the 21/31.

Coupled with the subjective element of one's judgment of what he saw and perhaps your trouble with red/green colour blindness?-- Correct.

And I sympathise with that because I have it myself. All those things play a part?-- That is correct, yes.

Of course there was a delay factor on the Unor between sampling and analysis, wasn't there?-- That is correct, yes.

Did you know that by 7 August?-- Pre-7 August, yes, I was aware that Mr Schaus and Mr Evans were talking about and looking at options of telemetric monitoring systems.

That's one of the systems referred to in Mr Mackenzie-Wood's book, isn't it, Strang and Mackenzie-Wood?-- It's another system for continuous monitoring, that's correct.

How long has that been around?-- I couldn't honestly give a date, sorry.

Pre-1985, I suggest, that's the first edition of Mr Mackenzie-Wood's book. I think it's referred to there. It's been around for a long time?-- The system has been in place for a while, as long as I can remember.

Do you agree with this proposition: it is fairly useless in comparing a Unor reading with the Drager reading unless the two measurements precisely coincide in time because of the velocity taken by the deputy?-- Sorry, to determine - could you repeat that question, please?

Yes. I'm just asking do you agree or disagree with the proposition that it's a fairly useless exercise comparing a Drager reading with a Unor reading of parts per million carbon

monoxide unless the deputy took the velocities at the same time as the underground monitor for the Unor took its sample, from Drager to the surface, they would have to coincide?-- They should coincide, yes, but -----

Because otherwise the velocity -----?-- It's not useless, sorry.

I said fairly useless?-- It's not even fairly useless, it's more than useful.

It's fairly non-helpful. Do you agree with that?-- You can at least have the ability to check off at 13 minute intervals when you did readings.

Had you ever heard of a Mr Cliff who is a scientist and who appears in Appendix 5 or an article by him appears in Appendix 5 to the SIMTARS reports in this case?-- I know of Mr Cliff since coming to the Inquiry. I hadn't met him at Moura until the Inquiry.

Before August of 1994 had you ever read any of his papers or literature?-- I can't recall if I specifically read Mr Cliff's reports.

Did you ever see any articles or papers or literature by Mr Cliff - perhaps it's Dr Cliff - around the Moura Mine offices of management?-- I'm aware of SIMTARS magazines that used to come to the offices, yes, but I can't specifically recall papers written by Mr Cliff.

Do you know of a paper by him relating to early detection and monitoring of fires and heatings in underground coal mines?-- No, I'm not aware of that.

Before the explosion?-- No, I'm not aware of that.

Are you aware it existed before the explosion and has that come to your knowledge since?-- No, actually it hasn't. I haven't seen the paper.

Do you know if a Dr Chamberlain, an English scientist who has produced as far back as 1973 or 1975 a paper or papers in relation to detection of spontaneous combustion?-- Post the explosion I have seen the blue book and the red book that contain his graph, yes.

Just look at these and say whether post explosion or before explosion you had seen that type of literature. Please don't mix it up with any other material. You need not look at every page, I'm more interested in the heading?-- Are there only two documents?

I can see there are lots of attachments, but the front one is a later synopsis and the other one is a paper, I think?-- No, I'm afraid I haven't seen them at all. That's the first time I have seen them.

But its title is - just read it out for the Inquiry?-- "The

ambient temperature oxidation of coal in relation to the early detection of spontaneous heatings - Part 2."

I suppose you can't comment on the ability of that document to help you if you've never red it, so pass it back, if you would. You talked about a red and blue book; which ones had you seen before August 1994?-- I had seen none of them.

Does that mean you hadn't read any of them, either of them?-- Hadn't seen any of them.

Nowhere in any of the offices of management at the mine had you seen them?-- I had not seen any of them, no.

But you yourself collected a bundle of material, I think you told numerous of my friends, some of which related to various aspects of mining. What did you collect that related to spontaneous combustion or carbon monoxide?-- I collected a book, the blue book -----

Sorry, could you just describe that, just pausing there?-- I forget the name of the title now as such, but it's an exhibit in the courtroom.

Is that "Mining and ventilation practices in coal mines liable to spontaneous combustion."?-- I think that's correct, yes. It's a blue-ish cover.

Did you ever read it?-- No, I did not.

Why would you collect it?-- To one day in the hope of reading it, I suppose, but I did not read it at that stage.

You got the glossy covered Strang Mackenzie-Wood book?-- That was given to me by Dave Kerr, that's correct, yes.

In 1992, perhaps seven years old by then, but nonetheless did you read that?-- Yes, I did, I read respective parts. I hadn't read cover to cover.

Well, did you not read parts relating to Coward's Triangle, Graham's Ratio, CO/CO2 relationship?-- I had read that section briefly, yes, the Coward's Triangle, the Ellicott's Diagram, yes.

Did you not read those sections relating to Graham's Ratio?-- I had read them, but I did not at the time put any significance to those particular numbers.

Why not? You were only in a spontaneous combustion seam, weren't you?-- A seam liable to spontaneous combustion, that's correct.

And with a known high gassy component?-- Yes, I had read a lot of literature on gas drainage and pillar design. Gas analysis was not something that I had spent very much time on.

Why not? You're management you have told us?-- There are only 12 hours in the day.

There is 24?-- You've got to sleep sometimes.

Lawyers get 24 hours?-- You could only spend 12 hours a day at work.

You agree that spontaneous combustion at Moura with a known gassy coal seam had the capacity to produce an enormous disaster?-- That is correct.

Yet you didn't read, as management, the fundamental materials about it, or if you did you passed over them?-- I had read it, but I didn't take much note of them.

Well, what do you say about that now?-- Obviously that's one part that you would have liked to have learned a lot more about in a lot more detail.

Not like, it was your first duty, wasn't it? The most dangerous thing basically which could happen within a mine atmosphere?-- That is incorrect.

What is more dangerous than blowing up a mine and killing 11 men?-- The high concentration of methane in the seam.

Without the heating or the ignition source there is no explosion, is there?-- Without the fuel you do not have an explosion. They work hand in hand.

Yes, of course they do?-- At the time that I had spent at Moura I had well and truly thrown myself into the gas drainage because at that time that was a priority to mine coal.

Always has been a priority. Are you saying it's priority to safety?-- No, to enable safe mining of coal you wouldn't be able to mine any coal if we didn't gas drain the Moura D seam.

I understand that. Well, you've told us about your ignorance in the respect at least of spontaneous combustion. Who else in management was charged with the duty of having that knowledge?-- I can't honestly answer that question.

Somebody must have had the responsibility. The buck must stop somewhere. Where does it stop? Does it stop with you or does it stop above you, and if so where?-- I don't know. I cannot answer that question. That's not a -----

In relation to literature generally which you've seen and produced to this Inquiry, you've mentioned red and blue and you didn't see those, but what about other books such as the three volumes of SIMTARS training for mine officials? Had you ever seen those firstly yourself?-- No, I had not.

Had you ever seen those in any other office within Moura whether it be No 2 office or No 4 office?-- No, I was not aware of it, no.

You are aware of Section 61 of the Coal Mining Act, aren't you, that is in the case of danger men are to be withdrawn?--

That is correct, yes.

And you know that all of the reliable literature says that after a sealing the men should be withdrawn or evacuated?-- Sorry, I am not aware of that, no.

Good mining practice in terms of preserving the safety of men would require that, I suggest?-- In hindsight with the information that we know for 512, yes, but the other panels that we had -----

Didn't blow up?-- No, there was no - we sealed it and continued to work.

I heard you say in evidence in response to one of my friends that you read the findings of No 4 explosion?-- That is correct, yes.

Now, you knew that that wasn't a spontaneous combustion or probably wasn't a spontaneous combustion, didn't you?-- Yes.

Yet you knew that Kianga and Box Flat were spontaneous combustions?-- I understood that Kianga was. I did not know about Box Flat.

What do you mean you didn't know? Did you not ever hear of the Box Flat explosion?-- No, I did not hear - I knew of the incident, but I did not know of the circumstances that prevailed in that mine.

Why wouldn't you read the findings of Kianga or inquire into Box Flat or indeed some of the spontaneous combustions elsewhere, explosions that is, elsewhere in Australia?-- Because at that stage spontaneous combustion was not a major issue that was being addressed. The major issue that I was addressing at that stage was the degasification of the D seam.

I am going to be a little while yet, more than a little while.

WARDEN: Thank you. We will take the lunch adjournment.

THE COURT ADJOURNED AT 12.58 P.M. UNTIL 2 P.M.

THE COURT RESUMED AT 2.10 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MARTIN: Mr Abrahamse, you were on day shift on Friday, 5 August?-- That is correct, yes.

And you finished about 3.30 or so?-- Normally about 4 o'clock, 3.30, 4 o'clock.

What was the system of staffing at Moura No 2 on weekends? Was it virtually a skeleton staff of management or no management?-- There was an undermanager that would be on shift on the Saturday day shift with a - with the electrical foreman or electrical engineer and the mechanical engineer or mechanical foreman there.

But periods of hours without an undermanager present?-- They were only there on day shift.

Not afternoon and not night?-- That is correct.

Can I just take you back to some questions that Mr Clair asked you about Martin Adams and Glen Everett and another gentleman who is Malcolm, I think it was. Having thought about it since, have you recalled anything of that visit about a deputy and a make of somewhere between 16 and 17 lpm?-- No, I'm sorry, I can't.

And did you do any plotting of a CO make after they left the mine on that day?-- No, not on this particular - not that afternoon. I did one in the morning.

Before they came?-- For the previous Friday. They only arrived some time after - I think after 9 o'clock.

You were in Court, I am sure, when Mr Morrison representing BHP and you and others went through a system of computer records relating to training or retraining of men; do you recall that? Some computer records as to courses they might have attended or safety meetings they might have attended?-- There is a safety chart, yes, with training -----

Does any such similar document exist in relation to people such as yourself, Mr Mason, Mr Schaus, Mr Barraclough or management generally, a similar document anywhere?-- There is a document that would record when we went to shift meetings or when we did refresher training, but as regards machinery, the only thing we would have is a PJB tick against the name.

With the benefit of hindsight which we have heard about, what different steps would you, indeed management - should, not would - should have undertaken in relation to panel 512? What do you say now that it should have done?-- Sorry, with regards to?

512 Panel, and in particular from 11 June onwards, what

different things, if any, do you say now it should have done?-- Well, obviously the CO make should have been watched a lot more rigorously and then accordingly plotted, and that being our system to identify any problems in the panel itself with regards to spontaneous combustion.

All right. Emerging out of that, what do you say about the usage of the Unor? I am sorry, I meant to say gas chromatograph?-- The gas chromatograph?

Yes?-- If we conduct - as a recommendation that comes out of - has come out of this, that maybe when carrying out a full investigation of a possible heating maybe it would be an advantage to take bag samples at respective spots in the goaf and also to be able to map out some type of plan of operation underground that you conducted underground.

You spoke about bag samples before, I think, to probably Mr MacSporran, perhaps Mr Clair. At Mines Rescue Mr Kerr or somebody else showed you about bag samples and how to take them?-- As part of our Mines Rescue training, yes.

For what purpose did you think you were taking bag samples or learning to do it?-- Well, obviously if you take a bag sample after an incident, you would expect the - well, at that time the tube bundle system to be inoperative, you couldn't really use a tube bundle to evaluate properly where you were getting samples from, so if you had the ability to re-enter the mine you would take bag samples at respective spots in the mine and have that analysed.

All I am suggesting to you is that bag samples of mine atmosphere could have been taken at any time in and around the goaf before sealing and analysed either on the Unor or the gas chromatograph at the surface?-- If after an incident, yes.

What do you call an incident? Are we talking about the same thing? Are we talking about, say, a re-circulation problem or short-circuiting or a layering of methane?-- You have to look at what context the -----

Just answer the question. Is that what you call an incident?-- An incident is after an investigation or investigating an area.

Just so we are on the same wave length, an incident is something that requires investigation. Are we talking about the same thing?-- We can clarify it as that, yes.

So, if one had an incident in 512 Panel, a bag sample in the area of the incident could have been taken there and then; right?-- It could have, yes.

Then taken to the surface and either put onto the Unor at the surface or the gas chromatograph?-- Well, if you are going to go to the trouble of getting a bag sample, you just as well put it on the chromatograph.

Did Mr Kerr at any time when you were in his company on

22 July suggest to you that more frequent readings should be taken?-- No, he did not indicate that to me.

Before 7 August 1994 were you aware of what was done in other mines in relation to usage of gas chromatographs?-- No, I was not aware.

Do you know that there is and was in August 1994 an Australian standard on the gas monitoring systems, in particular in relation to the calibration?-- Beg your pardon, could you repeat that question, please?

Yes. Did you know by August 1994 that there was an Australian standard in relation to the gas monitoring systems relating particularly to calibration?-- No, I was not aware of it.

Well, you are aware of it now?-- Listening to the Inquiry, yes.

Do you know whether the standard existed at Moura No 2 before August 1994?-- Sorry, I could not comment on that.

We have heard a bit about the cap lamp number supposedly being entered into the Unor when it was accepted or acknowledged; do you recall that evidence?-- I do recall that, yes.

Was there any such system according to you?-- I was not aware of such a system, no. I had personally not accepted any alarm and, therefore, I wasn't aware of it.

Well, the occasion might have arisen where you had to?-- The occasion didn't arise, no.

But the occasion might have arisen, mightn't it, where you had to deal with something occurring on the Unor screen?-- If I didn't know, I would have asked at least one of the deputies.

But nobody ever told you that there was a system of entering the cap lamp number when acknowledging an alarm on the Unor?-- No, no, I didn't know.

Are you familiar with the Minerisk analysis document which came into existence about possibly late in May 1994 in relation to 512?-- I was aware that a risk analysis was being conducted in that panel as a suggestion from Bernard Madden to Albert Schaus, but I had not seen the document at all, no.

By the time of the explosion had you seen the document?-- No, I had not.

Can you help this Inquiry - you were talking before earlier today about the Tecrete prep seal and Tecrete product. Can you say whether the usage of that as a final seal was ever approved by the Department of Mineral Resources?-- The approval documents for the material and the pumps - there was an approval for that, yes.

Well, the approval you are speaking about was as old as 1983

from the Department to Tecrete direct; that's right, isn't it?-- I can't comment on the date, sorry. I would have to see the document again.

Well, if we come back to my question: can you inform this Inquiry as to whether the Department of Mineral Resources had ever approved Tecrete as a final seal of a panel?-- Yes, I was aware that there was an approval letter to say that that was - that could be used, yes.

Well -----?-- That material could be used.

Well, where is the letter?-- I remember in some of the information the Inspectorate required they asked for the approvals from Tecrete. That would be one of the documents that the inspectors would have. Sorry, I wouldn't be able to tell you what number it is.

Have you ever seen that document?-- I collected that document. I obtained that from SIMTARS - from Tecrete and put that together with the other information requested. We were given approval from Tecrete that that system was in place in - or was approved by the Mines Department.

As a final seal. I don't want you to be under any misapprehension as to what I am talking about?-- Yes, the mesh block itself would have been developed for a final seal, that is correct.

I am suggesting to you that it was only ever approved as a stopping?-- We would have to determine that from the mesh block approval that the Department agreed to.

Well, you say that there exists, within the Inspectorate documents taken from BHP No 2, such an approval?-- There is an approval of the material used, yes.

Did you ever read it?-- Yes, I would have read it.

No, not would have, did you?-- I collected the information, I would have read it.

Well, what did it say?-- I cannot remember, to tell you the honest truth.

Why - just tell me this before I ask you the question: do you know how the Unor system arrives at this weekly average of the CO readings?-- I have never interrogated the actual workings of the system. All I had looked to do was get the respective dates that I wanted to look at. Obviously there would be an averaging system over whatever dates you requested.

Well, it's a computer. There would be thousands of calculations involved, wouldn't there, and they could be done within a second or so?-- They are done within a very short period of time, yes.

But you know, don't you, that a weekly average is going to even out any high spot?-- That is correct, yes.

Can you give this Inquiry any help whatsoever - and I am not attributing any default to you - as to why the - can I call it the daily log commenced on the 23rd wasn't continued after about the 25th or perhaps 26th?-- No, I can't comment other than the fact that someone would have made the decision that it didn't need to be done. The scare over the weekend on the 22nd had been assessed, analysed, investigated and put to rest.

Well, that's an assumption on your part?-- That's correct, because I was away for that week.

An equal assumption is that it was just forgotten about?-- Well, it was forgotten about on my behalf because -----

I am not suggesting -----?-- Because I had been told that the readings were - the parts per million were the same as the week before and that was confirmed by the dates that I had plotted up to the 29th.

Can you just help the Inquiry with this: the Quality Assurance person for ventilation was Mr Morieson?-- That is correct, in his written - in his position description, that is correct.

And of the choice between Bryon and Morieson, the obvious person to do the ventilation task is Morieson?-- Preferably if he was there, yes.

Well, I just want you to tell us why it was when he was called in on Friday the 5th to work that he wasn't put onto his usual duty of ventilation officer and Bryon put on deputy's duty?-- I had realised that Albert - that Allan Morieson was back from holiday on the Wednesday. I also knew that George was looking for deputies on the Friday afternoon shift, he was short a few deputies, and I suggested to Mr Mason that he contact Allan Morieson who had returned home, and he wasn't supposed to come to work until the Monday, and I said to George that I'm sure he would be willing to come back for one day - you know, come back on the Friday and pick up a bit of extra money.

Well, I understand that, but I can't understand - I withdraw that. Why wasn't Mr Morieson put back on the Friday on his usual and proper duty as ventilation officer and Bryon put back on his usual duty as deputy?-- I can't answer that honestly because I wouldn't know. The deputy shortage was on afternoon shift and that's the time that Allan Morieson came in, on Friday afternoon shift. Whether he suggested to George that he was still jet lagged, you know, from coming from overseas, I don't know.

Can I just ask you, please, to look at Exhibit 105? I don't know whether there is two documents pinned together there or not?-- Only one.

Well, the other exhibit is 91. They respectively are ventilation surveys of No 2: 27 June 1994 and 12 July 1994?-- That is correct, yes.

Now, I suggest to you there is a very significant increase in the parts per million - sorry, litres per minute of carbon monoxide on 27 June. You see 9.71?-- That is correct.

And when you go to the other one, 105 - sorry, 91, it rises to 15.07?-- In July, yes.

Yes. Now, that's a most significant increase, isn't it?-- It is an increase, yes.

Where, looking at those two documents, do you see any abnormality in any other readings of CO make anywhere underground?-- Of CO make?

Yes?-- At the bottom of the fans.

Where is that? What is that reading?-- In June you have got 10 litres at the shaft - southern return, and in July you have approximately 31.27.

What do you say is the explanation for those two increases?-- Sorry, I cannot answer - I don't know.

Well, I am not suggesting-----?-- Just one moment, please. One thing that is quite different to give those results is the quantity of air running through the panel at that stage.

Sorry, at which stage?-- The difference between the June and the July figures. In the June figure you have 5 parts - in June you have 5 parts at 32 cubic metres per second, but in the July, you have 6 parts; an increase of 1 ppm of carbon monoxide and an increase of roughly 10 cubic metres per second through the top return. That would be the indication that you would get a larger quantity.

What I'm asking, so far as 512 top return is concerned on the respective dates, there is a most significant increase, isn't there, in the CO make?-- There is an increase of 5.3, yes, over four weeks - 5.3 over four weeks.

And do you say or not that it would be good practice to investigate how that came about, or whether there was a reason for it?-- Yes, I cannot comment on the reason for that particular-----

No, but good practice to go and look at that?-- That is correct, yes.

You know - it is the case that you know, isn't it, that Mr Schaus found 19 lpm on 5 August 1994 in 512. You say you don't know that?-- I do not know that, no.

I suggest to you it was written up in the Mine Managers' Book for 5 August - record book - Mine Record Book?-- I'm sorry, no, I've not read the Mine Record Book. I'm unaware of that.

Did you know that the sealing was imminent when you left on 5 August?-- Yes, it was planned for the following week, either the Monday or the Tuesday.

Yes. Can you give any account as to why it was brought forward to the Saturday?-- I was not aware that it was brought forward to the Saturday at all, no, over the weekend, no.

When did you learn that? Obviously Sunday night or-----?-- That is correct.

Or very early Monday morning?-- I didn't actually learn about it on Sunday night. I found out earlier on in the morning.

All right. Were you available in Moura over that weekend?-- On the Saturday afternoon I had - at 2 o'clock I left Moura to go to Rockhampton to pick up my sister-in-law. I arrived home 7 o'clock that evening - that Saturday evening, and then on Sunday I was disposed all day at a church function.

But nobody in management told you that the sealing took place on the Saturday afternoon, very early Sunday morning?-- No I was not aware of that.

Nobody told you that, "Look, we really might need your opinion about what's happening here."?-- No, I was not asked.

I will just show you one document - Exhibit 149, I'm reminded. Just tell the Inquiry whether a graph, which you are about to look at, would have been any help, at least to you, in forewarning you as to what was going on in 512?-- You see, there is a fair bit of information on this just to be grasping in two minutes.

Yes, well, on the left and on the right you have the parts per million, right?-- That is correct.

Across the bottom you have the velocity?-- That is correct.

And in the centre of the page, you have a 10 lpm curve, 20 lpm curve, 30 lpm curve, which somebody has plotted and calculated?-- That is correct, yes.

Now, at any time before 7 August 1994, with your very little or lack of knowledge about spontaneous combustion and CO makes, would that have been of assistance to you, because it tells you on the Code at the bottom what you should do?-- It gives instructions to persons doing the reading, yes. The graph is just - I will need a little bit of time to digest everything that's been placed on that graph, but the instructions down the bottom are directives.

Well, if that's accurate, do you agree that that would have been of assistance to you before 7 August 1994 with the state of your knowledge?-- That's absolute comments down the bottom - that would have had to have been drawn up by somebody - sorry, there is a fair bit in that to digest, and there is a possibility that that could have been - someone has obviously gone into a lot of thought and detail to construct that. It would be an interesting point of discussion in the industry, I think, to have that analysed and find out where it has been.

That's the first time I've seen it.

I can tell you it is in use in a mine in New South Wales. But do you think that a document like that put up in a prominent place or places around the mine would help a person, without a great deal of knowledge about spontaneous combustion or CO make, to determine what he ought to do?-- Yes, I'm sure it would. I have no doubt about that.

If it existed before August 1994?-- No doubt. As a matter of interest, the 10 and 20 litres doesn't really indicate an area of - or the grey area that I call it of where the zone is. That is - it is an interesting issue, but it doesn't seem to be very clear to my mind other than the note down the bottom.

Let's just read it out. I'll read it out. "Any readings" - you read it out?-- I won't read it out. I think it is quite clear down the bottom what the instructions are. I'm just saying looking at the graph between the 10 and 20 lpm - I'm not saying it would be of assistance to people, but it is just interesting to see where the extreme danger of labelling lies in this particular graph - well above the 30 lpm curve. There was no indication-----

I suggest to you that it's not-----?-- No, no, I'm just saying looking at this at a quick glance.

Well, let's start again. From the extreme right - sorry, from the extreme left, with the litres per minute - or air quantity, I should say - across the bottom - so that if you go towards the right you have got, what, 42 cubic metres per second; you're in the extreme danger zone, are you not, at about 10 ppm?-- At 42.

About that?-- It looks between 10 and 15 ppm.

Extreme danger?-- At 10 to 15 ppm you are in that area, yes.

All right?-- I'm not saying that it would not be of assistance, I'm just asking the question, that's all.

Perhaps I might be-----?-- It would be interesting to see what the SIMTARS and everyone else thinks of it.

Do you recall a document which came about from a Quality Assurance program relating to emergency proceedings? It is an exhibit. I don't want to show it to you as-----?-- I am aware of it, yes.

But there is nothing contained within that document relating to emergency procedures, I suggest to you, about spontaneous combustion. You might need to look at the document to refresh your memory?-- No, I do remember the document. It doesn't specifically pertain to spontaneous combustion. It is - it was an emergency procedure for the evacuation of all employees from underground workings in the event of an emergency.

I suggest to you that there was - neither was there any contingency plan in the case that a panel, or 512, required

quick sealing, or quick sealing with a make of carbon monoxide which was considered-----?-- Sorry?

Was there any contingency plan?-- Yes, the establishment of your prep seals at the beginning of every panel is a system that's part of your Part 60 submission by the inspectorate to ensure that if anything does occur underground, that you have a rapid sealing process.

But it is one thing-----?-- And also at the operation there was Tecrete mesh that was on site that in the event of a major problem, that Tecrete mesh - not the mesh blocks - the mesh would be able to be erected rapidly and be constructed. That was an idea that was born from Mr Ziebell, or during an discussion between Mr Mason and Mr Ziebell to have on site that material.

Yes, all right. But as it turns out, the Tecrete seal was completed at about 1.10 a.m. with the explosion some 22 hours later, and I suggest that that was just an impossibly short time for any curing process to have occurred. You would have had no solidity at all within that period, or practically no solidity?-- It is surprising. You would have had some solidification of the homogeneous material, because the mesh blocks are of such a nature that it allows moisture to be released from the homogeneous or cementatious product. I can't give an exact figure, but it did cure - the one in 4 South level did cure fairly fast.

Yes, well, up to three weeks?-- As a - if you analysed it as a cementatious product, you would say that it had the properties of cement, or concrete, and therefore you would have different, varying curing periods. What the rates are, I can't exactly say, but the ultimate curing period obviously would have been three weeks.

In relation to spontaneous combustion or incubation period - or call it what you will - isn't the principal factor the fact that it can happen? It is known to occur and particularly known to occur in the Moura seams?-- It has occurred on one occasion.

Or more?-- And it could occur again.

That's the principal factor to look at, isn't it - that it can happen any time under a host of changing variables, none of which are consistent, one panel to another?-- That is correct. That is a possibility.

There is no question, is there, that the 512 seal was the final seal?-- The 512 meshblock seals were the final seal, that is correct.

Or were intended to be the final seal?-- That is correct.

But they did not, as we know, withstand an explosion?-- From post explosion and viewing the video, I don't think there were very many other seals that did either.

Let's talk about 512. It didn't withstand the explosion?-- No, the video shows that it did not withstand an explosion underground.

Just talking very briefly about the final monitoring point, I think you have said it would have been possible to have more than one point within the panel?-- Anything is possible. You just have to have enough lines, but, yes, it is more than possible to have more than one Unor point in the panel.

The desirable point, in so far as methane, at least, was concerned, would be in the highest part?-- That is correct, yes.

Which is towards - or it is outbye the final - well outbye - to the outbye of the No 1 return - as close as?-- Towards the seals rather than towards the inbye end of the panel, that's correct.

All right. But even so, one or two down No 1 return as well as that?-- That would be a preferable location.

And what is it, only a question of cost?-- Availability of tubes, I suppose.

One orders those from a supplier?-- Yes, you do.

Were you here the other day - I have forgotten the witness that spoke about it - I think it was Mr Edwards, perhaps, or Mr Robertson - only one shift to put up one extra tube to cope with one extra monitoring?-- That's correct, I remember that.

And as to tubing, I suggest that the cost of the extra tube would be only a few hundred dollars?-- Yes, it would be negligible.

For your examination which you did, I think in June 1994?-- My written examination that is correct.

And your study of the Mining Act and -----?-- That is correct.

You came on references to oxides of nitrogen, didn't you?-- That is correct, yes.

What did you imagine they were in the Act or the rules for?-- Specifically for diesel machinery.

And that's how one differentiates, isn't it, whether the haze is from diesel or from coal heating?-- You can use that, yes, to determine the -----

Because we know that oxides of nitrogen do not come from coal?-- That is correct.

But can come from diesel?-- Can come from diesels as well as - diesels obviously produce other gases as well.

In the very early stage of these proceedings there were tendered to the Inquiry some - or several videos relating to safety?-- To safety?

Yes?-- Yes.

More particularly I think one may have been called "Causes and prevention and fighting of fires and explosions", or broadly some title like that, and another was - was it "Fight that fire."?-- "Fight that fire", yes.

Did you ever see those yourself?-- As part of my induction.

But only then?-- Only then, yes.

Can you just help the Inquiry with this: you've spoken about International Mining Consultants and they gave a report in 1992?-- That is correct, yes.

One of their recommendations was that a computer model which was designed be used as a diagnostic and planning tool?-- That is correct, yes.

Can you tell us whether that was used in relation to the design of panel 512?-- No, I did not use that in relation to 512.

Can you say why?-- Yes, the principal reason that the International - Andrew Selff as such, in his report he gave to us was that we had to establish the 6 South overcasts. At the time of the pressure quantity survey we were losing about 50 per cent of the available fan pressure over the single overcasts in the 1 North West at about 24 cut-through and

therefore that was the bigger part of Moura No 2 Underground's ventilation problems. He was able to quantify - in his report he quantified the capital gain that we would receive by spending money on the overcasts further down dip which were finally located at 6 South. Until that work was actually completed and then a further pressure quantity survey conducted over the mine, and I had planned that - I was going to plan that for some students over Christmas - the model was therefore inaccurate. As they say, with models, any model, rubbish in/rubbish out and at that stage we needed to quantify again the extent of the benefits that the overcasts at 6 South gave to No 2 Underground and then evaluate that from there. On top of that Andrew Selff was asked to evaluate future workings for the next five years at Moura No 2 Underground with the assumption of installation of overcasts and other areas that we could - that we had the possibility to fix up, and using that information really limited me to just that one particular instance when he was there until we actually could modify the model to suit the current underground needs.

When you went to Moura No 2, I think you said in your evidence earlier that you were on a learning curve?-- I still am, yes.

I suppose we all still are, but you had nobody to teach you?-- That was one of my frustrating aspects of Moura No 2 Underground. The availability of consultants though over, the years that I was there, benefited me quite significantly in the methane drainage program and with regards pillar design and pillar criterior.

Left to your own devices as it were it would have been difficult to even identify a problem, I suggest, much less cope with it?-- That's suggestive, I don't know.

It's just common sense, isn't it?-- Suggestive.

Common sense, I suggest it's common sense. Did you write your own position description?-- Yes, I did.

I wish I could do that, I'd be sitting where Your Worship is?-- Obviously that was in consultation with the manager to see that I was - those were the duties that I had to perform, yes.

You gave yourself some onerous tasks, plenty of tasks. Can you just tell us briefly about the reporting clerk? He had a position description as well, didn't he?-- He did too, yes.

But as I recall the position description, and I can show it to you if you want to see it, there is really nothing about the description at all which relates to safety, but only to underground production or to production?-- Mr Eccles was a gentleman that looked after just specifically, like you said, the production and the maintenance downtimes. He assisted the mechanical engineer with the reporting of maintenance and then Mr Barraclough - or initially Mr Danvers who was a - safety training, and then Mr Barraclough, they looked after the safety statistic analysis that were then all combined at the end of every month to Mr Schaus.

Mr Eccles was on a statistical gathering process, wasn't he, with his underground reporting?-- With records production and maintenance and downtime, yes.

I'm just coming to that situation where there was no set-up or arrangement whereby there was reporting on a constant basis as a ship's log of significant incidents underground which could have been looked at with an overview by anybody?-- No, that is incorrect to make that statement.

Well, what is correct?-- In the deputies' cabin there was a book which allowed every miner, including undermanager and engineer, that if hurt in any circumstances underground could enter that into a log. That was viewed on a daily basis by Mr Barraclough.

"If hurt" did you say?-- If hurt. If I cut my finger, if I trod on a nail I could enter that into the book and then there were other more significant injuries, sprained backs, you know, twisted ankles et cetera that were reportable or - not reportable to the inspectorate, but were part of a reporting system at Moura that Mr Barraclough then collated using the undermanagers as mediums to fill out forms.

But relevantly to this Inquiry no system of reporting with an overview as to significant milestones or incidents relating to such a phenomenon as spontaneous combustion?-- No, personal injury there was not anything that really pertained to spontaneous combustion, no.

In the day-to-day work that you performed who did you have most to do with of, say, Mr Mason or Mr Schaus?-- The three of us worked together. I couldn't put a percentage on either Mr Mason or Mr Schaus.

Well, you could really if you thought about it, couldn't you?-- No, I couldn't.

You would know that you spent 50 per cent of your time with Mr Mason and the other 50 per cent with Mr Schaus or a 10th of the time with Mr Schaus and 90 per cent with Mr Mason. You would know that?-- I suppose more of my contact would be with Mr Schaus, but as I said, we worked very much together.

You said yesterday, I think it was, perhaps the day before, that a lot of the machinery was outdated and being upgraded or intended to be upgraded?-- Yes, I had very painstakingly evaluated how the machines had progressed over the last - a number of years to identify their productivity rate that they were working at and then made comparisons between other bord and pillar operations such as Laleham and then noting a machine's performance and being able to identify areas of that - timeframes where that machine either required overhauls or just needed to be replaced.

Did you turn your mind to the Drager which -----?-- To the - sorry?

The Drager monitoring or gas sampling device which was at the end of its life?-- The 21/31.

It was obsolete, wasn't it?-- The 21/31.

Yes?-- Yes, I did.

What did you do about that?-- In the fiscal year '95 budget we applied for the purchase of a Multiwarn - a single Multiwarn system.

And when did you apply for that? Before August 1994?-- The budgeting system with BHP Australia Coal basically starts in the November - in the December - the November/December/January of a year for the next 12 months starting from June.

The end of June probably?-- No, from the beginning of June to the next May. So basically a six month lead up to -----

I understand. Just very quickly tell me about the bonus system. Were the managers, undermanagers, engineers on the same rate of bonus as the deputies and miner?-- That is correct, yes.

You spoke yesterday about Mr Schaus taking the men to task about taking some bottoms in cut-through 13?-- That is correct, yes.

How much of the bottom in cut-through 13 was taken?-- How much of the bottom?

Yes? About 170 metres -----?-- The final cut-through, cut-through 13 has a dimension of seven metres wide.

Yes, but in length?-- Seven metres wide - sorry, and 160 across.

How much of the 160?-- How much of the 160? I think there were actually two sequences that had been taken by the time we actually - by the time they actually got called up to the end office or to the training room.

How much of the 160 metres are we talking about?-- Looking at about 60 to 70 metres.

That didn't happen in one shift, did it?-- No, it would have happened in two shifts.

And an undermanager there at least once per shift to observe what was going on?-- That is correct, yes. At what stage of the shift he actually gets in there, I don't know.

It's common sense, isn't it, that if air goes down a heading inbye and strikes a barrier pillar it's going to slow it down?-- It has a pressure drop at that location, yes.

Just very briefly tell me, why is it that you relied on Cocky Morieson's formula, may I call it, of a start of two with one per week added to it? Why?-- Because he was a more

experienced person in that field than I was. That's as simple as my answer can be, I'm afraid.

That depends, doesn't it, as you well know, on the level of his knowledge?-- He was quite - as you saw in the witness-box he was quite a credible witness, quite a knowledgeable man.

I'm not talking about his credit, I'm talking about how did you know that what he said to you had any foundation in fact at all?-- I had to take his word.

Why didn't you take the word of the available scientific evidence -----?-- I had not -----

----- in preference to Cocky Morieson?-- At that stage I had not thought to involve anyone else.

You didn't want to involve anybody else; is that what you said?-- I didn't ask anyone else.

You only had to look at the book you had, Strang Mackenzie-Wood. You only had to look there, didn't you? Didn't you?-- For the grey area between 10 and 20, yes.

As I understand your evidence there was no graph posted on the 22nd?-- No, there -----

Correct me if I am wrong about that?-- Yes, you are incorrect, yes.

Was a graph posted, the one that had the question mark rise?-- No, it was not. By the time I finished, I think it was close to seven - between seven and eight I posted the graph - the corrected graph with the corrected p.m. reading in the deputies' cabin and also the undermanager's office. I gave Terry Atkinson the graph with the line and question mark on it that same time that evening before I left.

There was none posted on the 29th, no graph posted?-- No, no graph posted on the 29th, no.

Was there one posted on the 5th?-- There was one posted on the 1st for the 29th.

Posted on the 1st?-- Posted on the 1st that had the 29th data on it.

So far as you know it was posted. You did it?-- No, I did not do - I had given that particular graph on the Monday morning of the first to Steve Bryon.

I didn't mean to mislead you. You did the graph and handed it out for distribution?-- That is correct, yes.

Was there one posted on the 5th?-- There was, yes. Again I gave that graph to Steve Bryon which has his signature on it.

In relation to the history of Moura so far as you knew it before panel 512, had there been multi-point monitors after

sealing?-- There had been two point seals - two monitor point sealings in the goafs, yes, in the bottom returns and the top returns for the 511 panel, for the 401/402 panel. I'm not sure about the 403 panel.

Did you not think on your way down No 1 return on 22 July to look behind the stoppings?-- No, I did not.

I have nothing further.

WARDEN: Thank you. It might be an appropriate time to take the break.

THE COURT ADJOURNED AT 3.10 P.M.

THE COURT RESUMED AT 3.50 P.M.

MR MORRISON: Your Worship, I have had the opportunity to speak to Mr Clair and, by arrangement, Mr Johnson is to be interposed and Mr Abrahamse stood down for the balance of the afternoon.

WARDEN: Yes, thank you. Nobody has any objection. We will stand you down, Mr Abrahamse. Tomorrow at 9.15 you will be required to return?-- Thank you.

We will interpose the other witness.

MR CLAIR: Your Worship, I call Gene Norman Johnson.

GENE NORMAN JOHNSON, SWORN AND EXAMINED:

MR CLAIR: Your full name is Gene Norman Johnson; is that right?-- That's correct.

Mr Johnson, you are a welder employed at BHP Australia Coal at Moura No 2; is that right?-- I was up until the 3rd. I finished on 3 February.

The 3rd of -----?-- February.

Now, you had started in the mining industry on 5 July 1972 at the Moura washplant; is that right?-- That is correct.

And you were transferred to Moura No 2 in 1974 and you remained there right through until February this year?-- Correct.

Are you also an honorary ambulance officer?-- That is also correct.

Now, Mr Johnson, were you on shift on Sunday, 7 August of last year?-- I was.

What shift were you working that day?-- I worked the day shift and then I come back in and did the night shift at 11 p.m.

During your spell there on day shift at about 1 o'clock in the afternoon did you have a conversation with Lex Henderson, one of the deputies there?-- I did.

What was the nature of that conversation?-- I just briefly had a few words with Lex and I asked Lex how the situation was down the pit and - in relation to 512.

Did you know what was happening with 512 at that time?-- I did.

What was that?-- It was going to be sealed, put stoppings up and seal the section up. He said to me that the - in fact the sealing was completed in the early hours of the morning, and I said, "How's the situation down there?", and he said, "If we get through tonight, we'll be okay." By that he meant that the gas mixture would have rose and passed beyond the dangerous level.

That's the way you interpreted his words?-- That's exactly how I interpreted it.

You had been at the mine when there had been plenty of other panels sealed; is that right?-- That's right.

Now, you say that you worked the night shift also. Were you there at the mine at about 11 p.m. that night?-- I was.

Did you have a conversation with a couple of people in the crib room?-- Yes, Jeff Taylor and Rodney Buckton, two fitters.

What conversation took place there?-- Well, there was actually no conversation prior to when Jeff said to me something along the lines of, "You don't look so good." I said, "I don't feel bad.", but I just intimated to him that I didn't feel right about the pit, something wasn't right. I intimated to him I didn't think it would be a good night to be going down the pit; I had an awful feeling about it.

Do you know what it was that prompted you to say that?-- Well, knowing the situation in 512 as it was, this was always in the back of my mind.

What did you -----?-- What could happen.

What did you know about 512 at that time?-- Well, I believe that there was a heating and they were sealing it up as quick as possible for that reason.

How did you come by that information?-- Well, I had heard it around the pit somewhere, just word of mouth.

Can you remember in any more detail just what was said to you to give you the impression that there was a heating in the panel?-- No.

Do you know when it was that you formed that view that there was a heating in the panel?-- All that day probably I'd had that feeling, possibly a bit the day before, Saturday. I felt uneasy about the whole situation.

Had you spoken with anybody on the Saturday about the situation in 512?-- No.

Had you been to a union meeting that morning on the Sunday?-- No.

Well, you can't remember in any more detail who you might have

spoken to?-- No.

Or how you might have come by any information to lead you to believe there was a heating?-- Not really. You speak to that many blokes on and off the shift you just - you know, it would be hard to remember who it might have been precisely.

Did you have any view as to when 512 was going to be sealed?-- I knew they were working on it. It was during the days leading up - the day or so leading up to Saturday I knew they were going to seal 512.

Did you know whether it was being sealed according to schedule or whether it had been brought forward?-- No, I could not say. I assumed that it was a matter of urgency because I believe they were working right around the clock on that job.

On the Saturday?-- Saturday, Saturday evening, yes.

Now, you were still at the mine then some little time after that conversation at 11 o'clock and something more happened, someone else came to the workshop where you were; is that right?-- That would be Bobby Davidson you refer to, yes.

And he said something to you. What was that?-- Well, that would be after the two fitters had told me that they were going down the pit. This is normal procedure, we tell one another where we are, and one of the fitters had said to me - I'm not sure which one - "We're going down to 6" - "5 South", I beg your pardon, "going down to 5 South". I just said, "Fair enough.", I knew where they would be, and I went and opened my tool cupboard, got my tools out and carried on with the job I had been doing on the Sunday morning and Sunday evening - afternoon, and I had a large piece of plate cut to shape to fit onto a machine. I picked this up with the overhead crane and was just lowering it into position on the Stamler feeder - that's the machine I was working on - and I heard a voice behind me, "Everyone in the crib room now.", or words to that effect. I looked around, it was Bob Davidson was standing there, and as soon as I seen his face - all the colour was drained out of it and he was actually grey, his face was grey. I said, "Good God, Bob, what's wrong?" He said, "We've lost her, mate, we've bloody lost her." I said, "What do we do?" He said, "Everyone to the crib room straight away." With that we started running. The TA that was over in the next bay cleaning, he run with us. We run across - through the doorway and down past the store and out the ramp heading towards the lamp room.

That was Clarrie Bayles, was it?-- Clarrie Bayles.

Did you notice anything about the atmosphere outside when you got out there?-- It hadn't - I had not seen the atmosphere or the outside the workshop until I run across the road because I was just taken up with my job inside and hadn't occurred to look out for any reason, remembering this is about half past 11 at night, and when I got up onto the roadway you could barely see very far in front of you; it was very murky, yellowy looking, foggy looking stuff. You could smell it, it

was an awful smell, and you could actually sort of taste it in the air. I glanced across to the car park, and they have enormous arc lights there, and it was very hard to distinguish one car from another, and that would be a distance of 60 metres.

Well, where did you go then?-- Went to the lamp room area, or we were told to go to the undermanager's office. As I went past the monitor room I glanced briefly at the monitor and it appeared the screen was showing all red. From there I went around to the - straight around to the undermanager's office to where Michael Squires was.

That screen, you say, was showing all red. You had seen the screen on other occasions?-- I have glanced - generally looked at it, yes, but I have never studied it. I have never been shown the screen actually.

You went around to the undermanager's office?-- Yes.

And who was there?-- Michael Squires was there in the office.

What was he doing at that time?-- He was having a telephone conversation with a person I don't know; I could only assume who it was. I only heard the tail end of the conversation as I went through the door and words to the effect of, "Get out here quick."

Now, some time after that, 5 or 10 minutes after that, two PJB's arrived up at the start point; is that right?-- That's right.

And then George Mason arrived some time after that?-- That's correct.

And were you instructed by Michael Squires to get all the men's names and to check them out and see whether they were okay?-- That's right, yes. I had been told that one young lad, Darren Young, had been involved in a bit of an accident down below and he was suspected of having a neck injury. I checked him out and he appeared to be okay.

Was there then some conversation a little later about getting the ambulance?-- I had mentioned to Michael as soon as he got off the phone had the ambulance been notified. He said, "No." When George had arrived I mentioned it to him again - I beg your pardon, I mentioned it to George, not again, and he in turn asked Michael had the ambulance been contacted. He said, "No." I got the impression that George was a bit upset over this. He immediately instructed Michael to call an ambulance and a doctor and he said to him, "I want them out here now."

Now, the ambulance was called; is that right?-- It was.

And that was about, or just before 10 past midnight?-- That's right.

And it arrived there about 10 minutes later; is that so?-- That's true.

Were you given then a printed sheet by Michael Squires which you understood to be the emergency procedure?-- Yes, Michael handed me this sheet of paper and he said words to the effect that, "You are with the ambulance." He said, "You make sure that the ambulance officers are conversant with this procedure."

And you did that?-- I did that.

And there was some conversation between yourself and the ambulance man about the number of men that were missing?-- Yes, Con Barritt, the OIC of Moura station, arrived with a cadet officer and he said to me, "How many men are missing, Shorty?", and I said, "There was 20 missing originally, nine have come out, leaves 11 unaccounted for."

And then you went on throughout the rest of the night, or the early morning, you coordinated the ambulance and the social workers?-- That's correct.

The doctor?-- The doctor.

The ministers of religion who came there?-- Yes.

I have no further questions of the witness, Your Worship.

MR MACSPORRAN: I have nothing.

MR MARTIN: I have nothing.

CROSS-EXAMINATION:

MR MORRISON: Just a couple of things, Mr Johnson. When you were there on the Sunday, you said you worked the day shift Sunday and came back for the night shift?-- That's correct.

And day shift Sunday the panel had been sealed?-- What Lex said to me was it was finished in the early hours of the morning. I believe that to be the early hours of Sunday morning. That's what I believe, yes.

Now, you were speaking to Lex Henderson, who obviously knew more than you did about the sealing?-- He would have done. He was the deputy.

And the conversation you related with him was that he made some comment about "getting through tonight"?-- Yes.

And you had in your own mind - you didn't ask him what he meant by that, but you made your own analysis of that in your own mind?-- That's correct. That's the way I understood it to mean.

Can I suggest to you that, in fact, he didn't say that to you - that, "If we get through tonight, we're all right.", or, "We're right." He didn't say that?-- Words to that effect, yes.

Words to that effect?-- Yes.

The way you have given your evidence and the way you gave your statement, you have put those words in in inverted commas as if you remembered the precise words. Is that not the case? Sorry, you will have to respond verbally so the lady can take down your response?-- I'm not sure. Do you want me to check with this here?

Well, the words I just read, "If we get through tonight, we're right.", those words are in inverted commas in your statement that the inspectors took, as if to suggest that those were your precise words?-- As near as I could, those were the words.

Something to that effect?-- To that effect, yes.

What Mr Henderson said to you was that the CO was going up a bit?-- Yeah, rising, yes.

And it wasn't of any concern?-- I don't remember him saying it was of any concern, no.

Well, words to the effect, "The CO is going up a bit, but it is not of any concern at the moment."?-- No, I didn't recall him saying that.

Well-----?-- His words were, "It's rising relatively fast and if we get through tonight we'll be right.", something to that effect.

Might it be that he said something to you and you analysed it just as you did tell us before that you analysed it?-- Possibly.

Right. It may be that he said, "The CO's going up a bit, but it is not of any concern at the moment.", and you took that to mean that if you made it through the night, you'd be right?-- Possibly.

I understand. Now, when you saw Jeff Taylor, was Buckton there too, was he?-- Pardon?

Was Rod Buckton there when you saw Jeff Taylor?-- He was in the area, yes.

Let me take one step back for a second. Sorry to jump around. I don't really mean to do it. I'm not doing it deliberately to you, I can assure you. Stay with the day shift for the moment. Did you speak to anyone else on the day shift who had either been down the pit or been on the sealing?-- I quite possibly would have spoken to someone who would have been down the pit, but as to what was the nature of the conversation, I couldn't say, because being in the welding that I am - the repair business part of it - you invariably talk to people over different jobs, so I possibly could have spoken to someone - but not that I can specifically remember - over the closing of 512.

You obviously knew on the day shift that men were, in fact, down the pit?-- Yes.

And that meant necessarily that men were down the pit after the panel had been sealed?-- Yes.

That was-----?-- I believe so, yes.

All right. Now, you didn't think at the time, "Just a minute, men shouldn't be down the pit. The panel has just been sealed.", did you?-- I beg your pardon? I'm a little bit deaf.

Sorry. That's my fault. At the time on the Sunday day shift, it did not occur to you that men should not be down the pit just because the panel had been sealed?-- No, it didn't occur to me.

That has happened in the past routinely, hasn't it?-- That's right.

Nothing that you encountered that day on day shift caused you to think there was any problem with 512?-- Not that I'm aware of, no.

Then let's go to night shift. You arrived at 11 p.m., and in the manner of welders, that's after miners arrive, isn't it?-- No. You say after 11 that the miners arrive?

No, you arrive after them. They get there a bit earlier than you do?-- Yeah, production crews start at 10.15.

About 11 they are heading down?-- They should already be down the face.

When you arrive, you probably go straight to the welding department?-- I do. I go straight to the crib room and that's where Rodney Buckton and Jeff Taylor were.

Obviously on the Sunday night you hadn't spoken to anyone at the mine that would have given you this talk around the mine that you referred to?-- No.

So, whoever that was, that must have been someone on the day shift on Sunday?-- It possibly could have been, yes.

It must have been, if it wasn't on Sunday, unless it was someone around the town?-- I just don't recall when it was exactly, that's all.

I mean, I know you can't recall who and precisely how or what terms they used, but as you understood it, there was talk around the mine by miners that there was a heating in 512?-- Yes.

And that wasn't something you knew of yourself; you had received that from other people?-- That's correct.

Now, you didn't say that to Mr Taylor on Sunday night - you didn't say to him, "Listen, there's talk of a heating in 512."?-- No, that's just what I felt. I felt uneasy about the whole situation.

I understand you had a bad feeling sort of all day about 512, as you tell us, but I'm just wondering why it was you didn't actually say to Taylor, even though you said, "This is not a good night to go down.", or words to that effect, why didn't you say to him, "Listen, there's talk of a heating down there."?-- I don't know. I don't know.

And did you think that you probably should convey that information and/or your feeling to anyone in the management side - Michael Squires, for instance?-- No.

And Michael Squires was undermanager on shift on Sunday night, wasn't he?-- He was, yes.

You know Michael Squires. It is not as if he is a stranger to you?-- That's right.

You know that he is a very approachable sort of fellow?-- Well, I wouldn't know. I never thought about going to see Michael. It was just a personal feeling I had.

You had heard this talk around the mine about what was going on down there. Did you give no credence to the talk around the mine?-- Not really, no.

You thought that was rubbishy scuttlebutt?-- No, I didn't think it was rubbish at all.

You thought there was something to it?-- I thought there was something to it. This has been done before. We have had sealings in the mine before and we have had heatings before.

You were aware of all of that from your experience, weren't you?-- Yes.

You knew the significance of a heating in a sealed panel?-- Yes.

I gather you had been through the '86 era when 5 North was sealed?-- I was.

Why, then, knowing that background and that history and knowing its significance and lending some weight to what you had heard - you didn't dismiss it - why didn't you think it was appropriate to go to Michael Squires, undermanager on shift and say, "Listen, Michael, I've heard that there might be a heating down there. I'm worried about it. I think something ought to be done."?-- Well, I never gave it any thought to do anything like that. Possibly in the back of my mind I was thinking that there are more qualified people around to do those sort of things, you know.

Oh, yeah, but, gee, Mr Johnson, you gave this information some weight, and you had a bad feeling about it all day, you say, and it was enough for you to make some comment to Taylor, but not enough for you to go and tell the bloke in charge what information you had. Well, you didn't even tell Taylor about this talk around the mine, did you, really?-- No, I did not.

When you spoke to him, he said, you know, effectively, "What are you looking so miserable about?"?-- He said something along those lines, yes.

You said what you told us: "Not a good night to go down the pit." He asked you, "Why?"?-- I just said, "I've got an awful feeling about the pit, that's all."

Did you respond to him in terms of, "Look, I'll tell you, Turbo - I'll tell you, Turbo, the 512 is going through its explosive range."?-- No, I don't recall saying that, no. I just said it wasn't a good night for going down the pit.

You didn't think it wise or appropriate to tell him of what you had heard around the mine?-- Pardon?

You didn't think it was appropriate to tell him of what you had heard around the mine?-- Well, possibly it never crossed my mind to mention that. I don't know. I can't say for sure.

That's the very thing that led to this bad feeling you had all day, isn't it?-- Yes, leading up to it, on and off, yes.

Not like a water-diviner where you feel these things in your bones; you felt it because of what you had heard around the mine?-- Well, I had experienced these feelings before, that's all I gave it.

I have nothing further, Your Worship.

MR HARRISON: I have no questions.

MR CLAIR: Your Worship, I just have a couple of questions in re-examination.

RE-EXAMINATION:

MR CLAIR: Mr Johnson, your position was as a welder at the mines?-- Yes.

Did you tend to stick to those duties as a welder, or did you get involved in a wider range of duties?-- No, not really. Just stuck to my own job.

Did you have much to do with what was going on underground?-- No, not really. I just talked to blokes - what's going on. Possibly on occasions we had reason to go down below and either measure up for a job or check for repairs or something.

It was suggested you might go and express your concerns to Mr Squires. Did you see it as your role at the mine to go to Michael Squires with that sort of concern?-- Well, no, not really. As I just said a few minutes ago, I thought there were more qualified people to come up with that conclusion than myself. It was only a personal inner feeling that I had.

Did you have - well, perhaps I should ask you this, first of all: would you have expected that the undermanager might know at least as much as a welder about what was going on underground?-- I should assume he would have done.

And that night did you have any view about whether Mr Squires might at least be aware of just as much information as you were?-- No, I didn't give that any thought. In fact, I suppose it would have crossed the back of my mind that he would have or should have known that. He was the undermanager.

I mean, you had your concerns-----?-- I did.

-----you have told us. Did you have any view as to whether, if Mr Squires had those sorts of concerns, he might then go ahead and do something about it himself?-- No, it did not cross my mind.

Didn't even think about that?-- No.

Thank you, Your Worship.

EXAMINATION:

MR NEILSON: Mr Johnson, just one question: you said you have heard talk around the mine about the fact that there may have been a heating. Did you derive that from your conversation with Mr Henderson or did you hear that elsewhere?-- I got that, I think - someone must have been mentioning that prior to - I was talking to Lex. He never mentioned the heating. He just mentioned the gas mixture was rising.

Okay. So prior to your conversation with Mr Henderson, you were aware that there was a possible heating in the mine?-- There was a possibility of one there, yes.

And when he said to you - or words to this effect, as you have said - "If we get through the night, we're all right." - did you relate that to the fact that there was a heating?-- I related it to - the only way I took it to be was that the gas mixture would rise to its peak of its explosive range and then what I would term would taper off.

So, when you then said to Mr Taylor, "Don't go down the pit tonight.", and then said, "I don't think it is a good night to go down the pit.", is that what was going through your mind when you made that statement?-- That's correct, yes.

The fact that there was a heating?-- Mostly because I would imagine - in my mind was the rising gas mixture, yes - something along those lines. That's just the feeling I had. I felt very uneasy about it all that day.

Thank you.

EXAMINATION:

MR ELLICOTT: I understood you to say in evidence that George Mason handed you the emergency plan; is that correct?-- No, that was Michael Squires. That was one for the ambulance.

Had you seen that emergency plan before that?-- No, I hadn't read it or seen it. I knew of an emergency procedure that did exist for the mine.

You knew one existed. You weren't involved in its formulation?-- No.

Were you aware that you may have a role to play in the execution of that plan?-- I may have done, yes.

So, you would have known before that night that you may be involved in what was in the emergency plan?-- Well, being a safety officer or first-aider, I should imagine that I would

have done, yes.

But you hadn't seen it prior to that occasion?-- No.

Thank you. That's all.

MR CLAIR: I have no further questions, Your Worship.

EXAMINATION:

MR PARKIN: Just one question, Mr Johnson: did anyone at the start of this shift tell you that 512 was to go through the explosive range?-- Did anyone tell me it was going through?

Yes?-- What, on that night?

Yes?-- Lex Henderson told me 1 o'clock that afternoon or thereabouts that it was expected to go through the range some time during the night, and if we get through the night, that would be all right.

But there was no-one from management ever said at the start of the shift that 512 was going through the explosive range during the shift?-- No, I did not know. I never saw any management on the night I started. They are approximately 200 yards away from the workshop, so-----

Thank you.

MR CLAIR: I have no further questions, Your Worship. Perhaps Mr Johnson can stand down?

WARDEN: Thank you, Mr Johnson, you may stand down. You are excused.

WITNESS EXCUSED

WARDEN: I don't think it is possible to start another witness at this stage this afternoon.

MR CLAIR: I do have another witness there, but he is not likely to finish in 10 minutes and may not finish in 40 either, Your Worship. I am at Your Worship's-----

WARDEN: No, I think we will have to terminate proceedings and recommence tomorrow morning at 9.15, gentlemen. Thank you.

THE COURT ADJOURNED AT 4.20 p.m. TILL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 15/02/95

..DAY 26

THE COURT RESUMED AT 9.15 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

WARDEN: Thank you, gentlemen, please be seated.
Mr Abrahamse, you are on your former oath that took the other day; you understand that?-- Yes.

You are still sworn, you are still bound. Thank you.

MR MORRISON: Mr Abrahamse, yesterday we were discussing, amongst other things, the occasion on 22 July when you went down the pit with Dave Kerr and Terry Atkinson, and we have discussed what occurred down there and your conversations also with Reece Robertson who was the section deputy?-- That's correct, yes.

Now, at some stage either on the way down or on the way out on that occasion did you make some comment to Mr Kerr about his presence on the inspection and how you viewed that?-- Yes, I just said to Dave - I think it was on the way out when we got to the surface - I just grabbed him on the leg and said, "Hey, listen, Dave, thanks for coming down." It just gave me a lot of confidence taking Dave down and gave us a bit of credibility for what we were doing underground on that afternoon, yes.

We were looking at Exhibit 96. Do you have the exhibit still with you?-- No, I don't.

Could of the witness have Exhibit 96 and 21? Make it 94 and 21. Going back to the Monday which was the 25th. Some entries had been put in Exhibit 94, that's the log, and some information from that was translated into Exhibit 21, the table, for the Saturday reading and we discussed that yesterday, the reasons why that was done?-- That is correct, yes.

Did I understand you correctly to say either yesterday or the day before that you didn't actually go to the deputies' reports to put those figures in?-- No, the Saturday's figures were off this sheet here.

Off Exhibit 94?-- Off 94, yes, that's correct.

Now, there was a change in the Maihak system on 27 July, as we know. Although the procedures and system were almost identical, there was a change in computer and transfer to a mouse system rather than just a touch screen?-- That is correct, yes.

When you came on 1 August to plot the 29 July figure, so that's the Monday following coming back to plot Steve Bryon's figure for the 29th?-- Yes.

Did you do anything by way of checking the weekly average figure from the Maihak?-- No, I didn't.

Have you checked that since?-- I have run a lot of information off the Maihak, yes, and would have checked that since, yes.

You have seen nothing that disturbed your - the veracity of that average reading?-- No, no.

On that Monday, that's 1 August when you were doing that work with Steve Bryon, did you go then to deputies' reports for your figures or did you get them from Steve Bryon?-- No, I obtained them from Steve Bryon.

And on 1 August, I think I am correct in remembering what you said either yesterday or the day before, you actually generated the graph for the 29th for Steve to sign?-- On the 1st, yes.

That's on the Monday?-- On the Monday, yes.

You had been away all of the rest of - Tuesday through to the Friday of the last week?-- That is correct, yes.

Now, on Exhibit 94 you referred yesterday to that notation of your own in the right-hand column, "one fan operation"?-- That is correct, yes.

Is the figure "9.2" yours?-- Yes, it is, yes.

Now, that was a very low velocity on that occasion?-- That's correct, one metre a second, yes.

You said yesterday that the drop in velocity would produce the rise in CO parts which you see there?-- You would expect that, yes.

Now, there is material which shows that the fan was down between 1.26 p.m. and 8 p.m. that day. Is that time period of the fan being down consistent with what you see in that line on the data?-- Yes, it's a fair - it's a good period of time on our down day for that afternoon.

Can you recall - that's Monday the 25th - was that an RDO?-- It was a non-production day.

A non-production day?-- That's correct, yes. A good time to do maintenance on the fan, for sure, yes.

And that's just as likely the reason why it's down, I take it?-- That is correct, yes.

Now, before we leave questions of the 22nd and this log and so forth, when you came out of the pit, or at least after you had done the checking, you reached a conclusion about the fact that the 8 parts was obviously not representative, it was incorrect?-- That is correct, yes.

Did Mr Kerr express a view about that too?-- No, he did not express - we expressed a view underground when - with the two sets of readings that we took and the confirmation of Mr Robertson, the deputy in the panel, that 8 parts was an incorrect reading.

Now, just one last thing on that point: you have taken Drager readings before yourself?-- I have done, yes.

On the long range tubes that we have heard that you take 10 pumps?-- That is correct, yes.

And that's what Steve Bryon had, high range tubes?-- High range tubes, that's correct.

Can you give us some idea if one just performed the normal pump procedure for 10 pumps, how much time that takes?-- It would take between three and four minutes to actually do 10 depresses.

If you worked efficiently, the minute one pump came out the length of the chain you would start the next?-- Yes, between three and four minutes.

And it could be longer if one let a little delay go after the chain coming to full stretch before the next pump?-- That's right. If you were doing other things or looking around and the chain was to its full extent, it could take longer than that.

Now, can I just ask you about some of the days which then followed after 1 August? So, the Monday when you were fully back after missing time sick?-- Yes.

On that Monday you had contact with Steve Bryon to do these figures?-- That is correct, yes.

And you have told us that the view you had was that the figures really confirmed what you had found on the 22nd, there was a general level?-- That's correct, yes.

No rise?-- There was - well, that on - there was a peak and that the general trend was around the 13, 14 or the 14 - between 13 and 14 over that weekend, yes.

And also onto the 29th when you plotted that day as well?-- That is correct, yes.

Now, on the Tuesday, which is 2 August, did you have anything to do with CO make in 512 or did you have any discussions with anyone about that?-- Just one moment, please. On the Tuesday?

Yes, Tuesday, 2 August?-- No, not with regard to CO make.

Did you go underground that day?-- No, I did not.

You can't recall any contact that day with people about the CO make. What about contact with anyone expressing concern

over either the level of the CO make or the trend or the range or anything else?-- No, there was - no-one had raised any concerns at that stage. I didn't raise any level of concern to anyone either.

The next day, which was Wednesday the 3rd, did you go underground that day?-- No, I did not.

We have heard that was a day when the board members of one of the companies went underground to 512?-- That is correct, yes, I had a day producing statistic figures and then also getting information for Albert for the afternoon.

Was that visit underground by the board members in the afternoon?-- In the afternoon, that's correct.

Did you have any contact with anyone that day which raised with you their concerns or general concerns about level of make, smells, hazes, all the things we have been talking about?-- No, not at all.

The next day, Thursday, 4 August, you did go underground that day, I think?-- I did, yes.

Was that a day when you went underground with Mr David Hill from ACIRL?-- That is correct, yes, David came for the - was scheduled for the whole day. He arrived in the morning and we left - he left late in the evening.

Now, can you tell us the reason for his visit?-- The results that we had obtained from the monitoring stations inside the 512 Panel were being discussed. He had -----

You mean the extensometer -----?-- Yes, the extensometer results, that's correct. That information along with information that he had on a new bit of software to update our geological strata model for future panel designs. The reason - the main reason for his visit was to look at possible designs for the 520 section, the one that we were going to start producing in the next four months.

So, 512 was discussed?-- 512 was discussed, yes.

And in the context of extensometer readings?-- That's correct, yes.

And was one of the questions that was the topic that day proposals to trial a 10 metre roadway?-- That is correct, yes.

Very much in the proposal stage?-- Very much in the proposal stage. David Hill had spent quite a considerable time in South Africa. They had actually trialled wide headings in that area. Again, this was getting - growing towards the concept of Moura No 2 becoming a pure development style operation.

Combine 10 metre roadways with a five metre coal height?-- On development you would go on the 3 - the 2.8 to 3 metre high

heading, and then on the return instead of using the ramping style that we did, if you had a wider heading - one of the options that we used in South Africa was to physically pull the entire panel back to the start of the transfer point, ramp down onto one occasion - ramp down onto floor once and then put the belt straight down on the bottoms and work inbye on that, and the 10 metre wide heading would give you better - well, once you had rib supported properly, you would get better productivity rates from that on the inbye.

And in your conversation with David Hill that day was the method of ramping that was being used in 512 discussed as well?-- Yes, from a productivity point of view, identifying that - David identified that that type of mining system was quite an arduous task on the machines that we had at the operation, and we were looking at a whole lot of different options and varieties and different types of systems that we could utilise at No 2.

Now, you and Mr Hill went down the pit?-- That is correct.

About 1 p.m.; is that correct?-- Yes, it was early afternoon, yes.

To which section did you go?-- We went straight to the - our first port of call was the 512 section.

Can you just tell me: where did you go in that section by reference to cross-cuts and headings?-- The crib room at that stage was between - was just in between 1 and 2 heading in the 510 section, cut-through 2, 510. The Rover dropped us at that location where we met Steve Bryon who was the deputy on shift. We then - I then said to Steve that - introduced Steve to Dave; they had already met on previous occasions.

Can you just pause there? Did Steve Bryon say anything to you about any concerns to do with 512 that day?-- No, he did not, no.

All right. You met there at that point, and did you then move into the section proper?-- That is correct, yes.

To which point?-- At that time the miner had just completed the taking of bottoms between No 1 and No 2 heading - I beg your pardon, No 1 - yes, between No 1 and No 2 heading in 1 cross-cut. So, they were just - when we came there, they were just in that intersection one pillar inbye of the crib room, so you could effectively see the miner from the crib room.

Did you go somewhat inbye of that intersection?-- Yes, we just went past the intersection towards the goaf, but only about 10 metres - 5, 10 metres into the goaf, just to have a look at what the goaf was like.

Did you notice then or did anyone mention to you that they had noticed anything unusual?-- The only unusual comment that - or not unusual comment, but the only comment Dave had made was the fact that the boys had cleaned up quite significantly better than they - or to a larger degree than they had in the early parts of the panel.

Nothing abnormal in terms of smells, or heat, or haze, or anything that we have been discussing?-- I did not identify any of that, no.

What about the velocity or apparent velocity of the ventilation?-- At that stage it was very - the dust was carried away quite well down the No 1 heading - No 2 heading, I beg your pardon.

Where did you go from there?-- David wanted to have a look around number 3 heading. We just walked up to the number 3, had a look into the goaf, and then came back out towards the crib room where Steve Bryon was.

Then where did you go?-- I then notified Steve that we would be going into the return.

The top return?-- The top return, No 1 heading, just so that Dave could have a look into the goaf to have a look at the remnant pillars that were formed.

Up to that point, you mentioned that you had gone along - I assume it was 1 cross-cut to No 3 heading?-- That's correct, yes.

Anything abnormal on that perambulation?-- No, not that I can recall.

Now, you went into the top return. What did you do there?-- We basically walked through the prep seal and then walked down to every stopping that had a hole or brattice over it and David wanted to peer inside as far as he could. Because we had taken bottoms up to 10 metres from the stopping itself -

and in some cases it went a little bit further, closer towards the stopping - some of the stoppings you couldn't physically get through them and stand on the goaf, you just had to physically look through the plaster board or the hole or the door or the brattice, whatever was there, yes.

And I take it from what you say in some of the cases you could get through the hole?-- Some of the case you could get through and stand on the edge, yes.

Did you and Mr Hill do that where you could?-- At every location where we could, that's correct.

How far down the top return did you go, looking or going through all the holes and stoppings?-- I don't know the exact location. My memory - the recollection of my memory only gives me an indication that we went all the way down to between 11 - 10, 11, 12 cut-through, around that area, only because I saw the openings in the stoppings, right at the bottom of the panel.

You saw that at the stoppings?-- That's correct.

Now, where you could, you went through, and where you couldn't, you looked through?-- That is correct.

Now, on that inspection down there and during that process, did you observe or did Mr Hill give you any indication that he might have observed anything abnormal - smells, hazes, heat, anything?-- Not with regards that, not at all, no. He was just very surprised that the pillars had stood up as well as they had done and that basically - his reason for wanting to go and have a look in the panel was to confirm the extensometer results and their readings with what he could physically see underground.

Now, having got towards the bottom of the panel, did you then come back out the top return?-- That's correct, yes.

Did you do anything more in 512?-- Not in 512. Oh, the other thing that David wanted to see - he hadn't actually traversed No 1 heading - he just wanted to identify the section between 5 and 7 cross-cut - where we had taken bottoms and left canches on either side, he wanted to physically have a look at that, see what it looked like, with a view to getting an idea about this 10 metre wide roadway, and also at that location we had the extensometer and copper tubing that ran from the internal 512 to the actual monitoring location in the 5 South heading via a borehole. He had not seen that before. He wanted to physically see that.

When you got back up to the top, did you speak again to Steve Bryon - section deputy?-- No. Before we went into the return I had told Steve that we were going down No 1 heading and then straight into the 5 South bottom return to do the monitoring.

And is that what you did?-- That is correct.

And eventually you returned to the surface and was there some

conversation with Mr Schaus, Mr Mason or Mr Morieson?-- No, I think after that we went into the 510. From there we walked down to the 510 to the drilling section. That was for my purpose. And by the time we came out at that stage, it was well past - it was 6 o'clock, 7 o'clock, yes. No-one else was there.

Now, on that Thursday, that's 4 August, was there a usual sort of meeting that was held that day?-- That is correct, yes.

That is to say every Thursday - not necessarily the 4th - Thursday?-- That's correct. That was the overtime meeting.

Explain to me what that is?-- Every Thursday Mr Mason would call together the engineering people - the people from the engineering department - the electrical and mechanical engineers - and they would set out a plan of what work they proposed to do over the weekend and that was organised on Thursday - every Thursday.

Were you at that meeting?-- I was not at that particular meeting. Albert and I were with David that morning.

So, did you find out about the results of that meeting?-- Yes, we had - yes.

When did you find that out? Was that the next day at the production meeting?-- I can't recollect an actual time when I found that out, but there was - whether it would be the next day or on the list - the overtime list that Mr Mason had worked out.

But documents were produced? Lists of tasks, and so forth?-- Yes, that's correct. Tasks were listed and then the number of people that were required to perform those tasks were listed on a specific QA overtime sheet.

That was a regular feature of that aspect of mine planning - that tasks would be documented and listed and put through the QA system?-- That's correct, yes.

On the next day, which was the Friday, 5 August, did you go underground that day?-- No, I did not go underground that day.

You mentioned that you had - I think it was - I can't remember whether it was yesterday or the day before - you had spoken, I think, to Mr Schaus about stoppings in the top return?-- That is correct, yes.

Was that on that Friday?-- That was in the morning of that Friday, that is correct.

And you were asking him, you know, what was the reason for the holes in the stoppings down the top return?-- That is correct, yes.

Did you have contact with Steve Bryon on the Friday - that's 5 August?-- Yes, I did, at the end of the day - towards the

end of the day.

Did he provide you with some results for the purpose of plotting on the graph?-- That is correct, yes.

Can you recall in what form he provided them to you? Did he have some log, piece of paper, report, something written, or did he just read something out to you?-- My best recollection is it was just on a piece of paper - a pocket notebook or piece of paper.

Did he tell you something about the particular results he was giving you - as to who had got them?-- That is correct, yes. He said that part of his duties on that Friday as an acting ventilation officer was to check all the water barriers - that they were topped up, and their location - he had done that for the better part of the day - and that Dick Stafford had taken a reading for him, and that was the reading that he presented to me.

All right. You noted something about the readings. You can look at Exhibit 21 to see what they were - that's for 5 August. Did you note something about the velocity?-- Yes, I did.

What was that?-- I noted that the velocity was 1.55 metres per second. That was down - or a lower reading than we had previously experienced through the - over the last couple of weeks.

Did you ask Steve Bryon about it - ask him what the reason was?-- No, I did not ask Steve at all, no.

Did you have a view about why it had happened yourself, or did you go and find out why?-- No, once I published the log and the graph, Steve signed the graph. He then took that particular graph to the deputies' office, or deputies' room and I took the other copy to the undermanagers' room and I asked George at that time what actually - I pointed out the lower velocity in that panel for that day.

And what did you find out about that?-- George had said to me that a deputy's report earlier that morning indicated that there was some layering in the 520 panel.

Just point out 520 on the map for us. You will have to flip it down?-- The 520 panel is located around there.

So, it is the bottom of the 5 South section and is like a stub in a north-westerly direction from it?-- That is correct, yes.

He told you there had been some layering of what?-- Of methane in that general area and a decision was made that the regulator in the 5 South bottom return was to be-----

Can you point out where that is - that is to say, the position of the regulator. We know where the bottom return is. You can do so on the big relief map or the general map, if you

like?-- The regulator is located between cut-through 19 and 20.

In the bottom return of 5 South?-- That's correct.

So, what was to be done about the regulator?-- That bottom regulator was to be opened up so as to be able to remove that layering in the 520 panel.

And as you understood it that had been done?-- That is correct, yes.

Did that explain to you the drop in velocity for 512?-- That is correct, yes.

And would that lead, in your judgment, as you told us on a previous occasion, with lower velocity to higher CO parts?-- That is correct, yes.

Is that what we see reflected on that reading for 5 August?-- That is right, yes.

Now, when Steve Bryon brought you the figures that day, we are talking about 5 August, on the Friday, did he bring you all the figures that you needed to put in?-- That is correct, yes.

Including the Maihak average?-- Yes.

Can I ask you this: on that day, that's 5 August, that was, as we know, the first day that Mr Morieson was back at work even though he wasn't rostered to come on. He came in to fill in a deputy's position or a miner's position?-- A deputy's position on afternoon shift.

Had you spoken to him in the few days leading up to that time?-- Yes, we had dinner with him on the Wednesday night.

I suppose it's a trite question, but did you discuss matters to do with the mine?-- Yes, we did dig coal, yes.

Specifically in relation to 512 and its CO make levels and things like that, did you discuss them with Mr Morieson?-- I did discuss the incident on the 22nd, yes.

Did you fill him in on what had been found in the 18.98 and so forth?-- That's correct, yes.

So he certainly would have known that when he was at work on the Friday?-- He was aware of that, yes.

Can I ask you one other thing? You mentioned yesterday - it may have been the day before - you were asked a question in relation to the Graham's Ratio?-- Yes.

That's the CO/O2 deficiency ratio?-- That's correct, yes.

I think your general comment was you didn't really know much about it or pay attention to it?-- That is correct, yes.

But as at the date of this explosion did you have some understanding about its usefulness or otherwise in a post sealing situation?-- Yes, the general formula led me to believe that once an area was sealed that that formula became nil and void because there wasn't any air physically flowing past that monitoring point because methane displaces oxygen and a whole lot of other things, and the fact that you weren't having fresh air passing that point all the time, you know, I

made the assumption, in my terms, that it wouldn't be relevant after sealing.

Is that a view that you understand is held by others?-- I'm not sure on that. That was my view.

Certainly your view at the time?-- At the time, that's correct.

Can I ask you about the procedures that were done for methane drainage, and I will talk about the actual formal procedures, the written documents?-- Yes.

You had a hand in producing those, I think?-- Yes, I did, yes.

Could the witness see Exhibits 57 and 58? Now, are they the documents that are referred to as the methane drainage procedures?-- Exhibit 57 is the gas drainage procedures and 58 is a list of work instructions. There is a difference between the procedures and the work instructions.

We know what the two documents are, but they are the documents that you worked on to produce in relation to that area?-- That is correct, yes.

You can hand them back. Can I ask you about the Tecrete seals that were used at Moura? When did you first become aware of their use at Moura No 2? Was it in relation to this 4 South panel?-- The Tecrete stoppings were used well before my time. Tecrete as a company had been introduced to Moura before '92. As Tecrete developed new ideas one of their new ideas was the Tecrete mesh block and to be able to use that for prep seals. The first time we actually used one was in the 4 South Level area and that was basically a trial to see what the blocks were made out of and what their structure - what the structure was like once it was constructed.

Did you have some interest in that? Did you pay attention to the way it was done and the results of it?-- That is correct, yes, I did.

Did it have some advantages over using the previous system which was concrete block?-- In my opinion it had a significant number of advantages.

Which were?-- The list would go from the fact that the mesh blocks were a lighter product to work with, secondly, you were pumping an homogeneous cementatious grout into a void or basket so you would get a better seal, and thirdly, the expected rate of construction could be quite significantly faster once developed. Using those three major benefits we thought that that type of system would be far superior than the bricks, including the fact that you would place roof bolt reinforcement reo from roof to floor and rib to rib.

You regarded all of those features as a significant improvement over block?-- That is correct, yes.

Did you in fact generate some documents for the purpose of

showing people how to insert the bolts and the general design of various Tecrete seals?-- Yes, I constructed the work instruction, yes.

We have seen that document, I think. I don't think I will show it to you again. Now, did you have some knowledge or at least some understanding of the strength of Tecrete?-- Yes, the brochure said that it had a 60 mPa strength.

And mPa is how many kPa?-- It's to the six - 10 to the six.

It's much higher than kPa?-- Yes, kPa is 10 to the four, yes.

60 mPa is a significant increase on 345 or 375 kPa?-- That is correct, yes.

You are working there from brochures; you haven't done any tests yourself?-- No, we had not done any tests ourselves.

There is one other thing I want to ask you about and that -----?-- If I could just add something, the first time we used the seals were in the 4 South Level for us to obtain an - to get an idea of what the seals would look like and how to construct them. Steve Bryon, the check inspector at that stage, was - the seal took a long time to construct, but the finished product was quite a superior product and that was his opinion too after looking at the trial seal.

Did it take a long time to construct because it was done over a number of shifts to let everyone have a look at it?-- That's right. It was only done on one shift per day with fellows that were - they had not seen that type of method, and Robert Parker was the gentleman that was there to instruct them how to construct it.

Can I ask you something about a different area? In relation to the communication of information deputy to deputy and deputy to undermanager and so forth, was there some work being done in relation to the production reports by deputies?-- Yes, it was. We had discussed trying to develop systems whereby the deputies would have more of an organisational role in their respective panels with regard supplies and what they needed to do the next day and things like that, and then to give the - basically the undermanagers at No 2 were performing deputies' duties and then, you know, more senior management were doing planning duties. We were trying to give more onus on planning to the people that were in charge.

Namely deputies?-- Namely deputies and also the undermanagers.

Did you have in mind introducing a more descriptive form of deputies' report?-- Yeah, it was in the throes. It was very much a discussion stage at that time prior to the explosion. Nothing had been put down on paper.

It was not an area that was being ignored?-- No, Albert Schaus was looking at a lot of work practices that were going to be evaluated and looked at from the union side and also from the

company side.

In relation to the reports was there some contention on the part of the deputies about the amount of time they had to spend doing that sort of report?-- Yeah, the deputies before my time were paid an allowance or an overtime to some degree, I think, to fill out reports or some came in a little bit earlier. I don't know at what stage that was taken away from them, and then they basically stopped filling out statutory reports for planning or for requesting material or information. They completed their statutory duties, the inspections -----

But not the planning?-- But not the planning stage, and we were trying to look to go back towards a system similar to that.

In relation to the period after the incident, on the 7th you mentioned yesterday the presence of an incident team at the mine site?-- That is correct, yes.

On that incident team were a number if not most of the inspectors?-- That is correct, all inspectors.

Was there a union representative on that team as well, Mr Matt Best?-- He was there for some time, yes.

Those people had access to the mine offices and documents?-- Yes, everything was opened up, yes.

Do I understand correctly there were a lot more people therefore through those offices than there would be normally?-- Yes, that is correct, yes.

What was your role in relation to data and documents? Were you part of the incident team itself or were you just like a gopher, if I can use that term?-- I was not part of the incident team itself. When - if they requested work to be done it - I would be given respective tasks to complete that work. The main task over the two days was to establish what atmosphere we had underground via the boreholes. So at that stage it was lowering a Unor tube to respective sites or via respective boreholes and then sealing off boreholes because - so as not to have contaminated data.

Your role was really a responsive; one if you were asked to do a task you did it basically?-- That is correct, yes.

Now, can I ask you one last thing if I may, and that is in relation to some of the data which we have seen, namely the alarm logs and some reports that suggest slightly high methane levels in 510?-- That's correct, yes.

On the Saturday?-- On the Saturday, yes.

Now, we have heard that the span gas tests were being done on the Saturday and some high methane levels were recorded there and one of the deputies has given evidence that he had an explanation for that, namely it was Bob Newton cracking the

seal or cracking the valves and draining the methane, draining water out?-- Draining water out of the water trap, yes.

Now, do you have a view of an alternative possibility in relation to the presence of methane in 510 in that area?-- An alternative, I don't know how feasible it would have been at that time, but an alternative would be one of the victaulic seals physically being blown and therefore allowing larger quantities of methane to -----

To leak out?-- To leak out, yes. At that particular time we were really beyond the peak flow that we had produced from the nine holes that we drilled between 510 and 1 North West, and what I'm saying is that the range was obviously subjected to a lot more pressure earlier on in the piece and not specifically at that time. That's my only reason for hesitation with regard to a possible seal leakage at that time.

Do I understand correctly, you get water and coal dust going up through the system possibly to the surface?-- That is correct, yes.

There is a flame arrester at the surface?-- That is correct, yes.

And the purpose of the flame arrester is to stop a reverse ignition going back down the range?-- That is the purpose of the flame arrester, yes. What we had done over the years, we had installed a number of water traps at the hole itself and we had also installed a - what we called a horse. It was just a - the pipe range was a six inch diameter. We increased it to about 120 - we just put a big cylinder in line and that assisted us by dropping the velocity and, therefore, dropping the water out of the range with coal dust and everything else. So, that effectively stopped the coal dust from being - from travelling all the way up to the flame arrester and blocking the flame arrester.

As a possibility, you think one - we should, or somebody should consider whether the pressure on the range may have resulted in a rubber seal being blown?-- A rubber seal could have worn over that time and then, you know, sequentially leaked over that period, but on the Monday morning Ken Guest, a deputy, and myself after the incident about 4 o'clock in the morning went to the surface boreholes to see if any methane was physically coming out of the boreholes. So, we would have - we took - we would have had to take the flame arrester out of its casing. At that time there was only fresh air at the surface of the boreholes and the flame arresters were clean.

I have nothing further, thank you.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Abrahamse, can I take you back to Exhibit 12, which I think is the position description you were shown by Mr Clair initially. You don't have that in front of you now, I don't think?-- No, I don't.

And you may not need it. You have agreed, I think, that part of it, point 7, refers to part of your role being to assist the ventilation officer with mine ventilation requirements and modelling for future mine panel designs?-- That is correct, yes.

So, part of your role was to assist the ventilation officer who was, we know, for most of the time, Allan Morieson?-- That is correct, yes.

But I understood you also to say that you had no day-to-day control over ventilation matters in 512?-- No, that was the undermanager's role.

So, he had the ultimate control of how the ventilation requirements would be satisfied in 512; that's the undermanager in charge?-- When you say "control", could you -----

Well, the authority, I suppose, to - the authority to change and oversee the entire system inside 512?-- Yes, yes, the undermanager in charge and the undermanagers, yes.

And the ventilation officer himself, Allan Morieson, wouldn't have that authority?-- No, he would be the doer.

On the undermanager's instructions?-- That is correct, yes.

Well, somewhere in that range of matters comes your role to assist Morieson; is that so?-- That is correct, yes.

You had no authority yourself to direct Morieson to do anything in terms of ventilation?-- No, not authority, no. Allan wasn't responsible to me or me to him.

These position descriptions were part of what is said to be the Quality Assurance or QA system in the mine?-- That is correct, yes.

Given that part of your function was to assist him, was there a procedure to cater for the situation when you weren't at the mine?-- As part of my position description it says that if I wasn't at the mine, the manager or the underground superintendent would either allocate my roles or he would take them on himself.

So, if, for instance, you went on holidays, which you did, I think, on 16 June until 11 July?-- Yes.

The role of assisting Morieson with his ventilation duties would have fallen to the undermanager or someone delegated by him, you would expect?-- I would expect, yes. We ran a very tight ship with numbers of people at - you know, duties just flowed between one another.

You say you ran a tight ship. Was it tight but informal?-- That's right, yes. If I was asked to do - if I was asked to do a specific task, well then I would go and do that. It was - yeah.

As far as you know, when you did go on holidays, there were no discussions with you about who would be filling your role of assisting, if necessary, the ventilation officer in your absence?-- Well, "assist the ventilation" was really in its broadest sense, looking at the life of mine, overall layout, where overcasts should be, a planning role as well as if Allan needed assistance for - like he did with his monthly ventilation reports, you know, cataloguing them or collating them.

Is it fair to say that you fulfilled that requirement of your position to assist him mainly in the area of setting up this graphing and tabulating the information about CO make; that

was the main way you assisted Allan Morieson with his ventilation duties?-- That was one aspect, yes.

Was it the main aspect?-- The main aspect for the CO make. There were other - like I said, a lot of other aspects. We worked together designing what size overcasts we needed, what depths that we needed to grade to on the floor, where we needed them, the location, the size of them, all those things. We had a number of projects. The report that was submitted to Andy - from Andrew Selff listed quite a number of recommendations, and those recommendations initially stated that the overcasts needed to be done. There were things like pressure chamber seals that we were going to look at, modifying existing overcasts to reduce pressure that - the pressure drop that was current at our main overcast over our dip. There were a lot of functions, looking at taking away major restrictions such as in one location the 1 North-west return had a major kink in the line, we were looking to blow some of that coal away; all of those sort of facets.

All right. Just returning then to the Quality Assurance side of things, to your knowledge was there a procedure for someone to replace Allan Morieson when he was absent from the mine as ventilation officer?-- There wasn't a procedure to say, "This is what you had to say to the next fellow." Allan's position description was available. Not only did he do CO makes or monthly ventilation reports, he looked after all the firefighting, the underground water barriers, stone dust collecting, fire extinguishers, making sure they were all up to scratch.

You see, what I am asking really, I suppose, is: was there a procedure in place to make sure that whoever replaced the ventilation officer was someone who was competent to carry out that role at the mine in his absence?-- There wasn't a procedure. The system would be that his position description was made available in the end office and for that procedure - for that position description to be - that could be read with all his work procedures, his stone dust procedures, his firefighting procedures and his ventilation procedures.

See, the evidence tends to indicate here that when Allan Morieson went on holidays, his position was filled by Steve Bryon?-- It was, yes.

But that before Morieson went on holidays he had no opportunity in the end result to speak with Bryon and inform him as to his duties and the way they should be carried out?-- That's correct, he did not, yes.

Was the system designed for Morieson ideally to have spoken to Bryon before they changed roles, or didn't they arise?-- On that particular occasion it didn't arise. The system in place allows you to look at those position descriptions which are made readily available and the procedures in that end office, but I did not - I did not show Mouse any of those procedures. The stone dusting itself was an aspect of the mine that many of the deputies knew how to perform.

I suppose the stone dusting, though, wouldn't have been - well, I withdraw that. The most important role for the ventilation officer would have been looking after the actual ventilation on the site at 512; is that so?-- That would be one of his aspects.

And would you agree one of the most important aspects of his duties?-- All statutory aspects are important, and that is one of them, yes.

The ventilation of the panel is vital to the safe operation of it, isn't it?-- Yes, well, without ventilation underground you wouldn't be able to operate. It's not for the one panel.

In any event, you say that the person relieving Morieson would have had access to Morieson's position description as a QA document?-- That is correct, yes.

Which would simply set out descriptively what his duties were?-- That is correct, yes.

Without explaining how they were to be carried out?-- Yes, you would not get a blow by blow description of how he did things, no.

That would rely upon the outgoing ventilation officer perhaps?-- That is correct, yes.

Instructing the incoming, relieving officer, in what was required?-- That is correct, yes.

And that doesn't appear to have happened in this particular case when Morieson went on holidays on 17 July?-- No, not to Steve Bryon it didn't, no.

Again, looking back on it, that's obviously undesirable, isn't it?-- It is a system that needs to be refined, yes.

And the Quality Assurance system is designed to deal with problems such as that, isn't it?-- That's right, it will highlight those type of problems. I mean, giving fair credit, we had just introduced the system.

And you were still developing it?-- It was in its infancy, yes.

So, that system ordinarily, and hopefully in the future, would ensure that when a change of position occurs like that, the person taking over would be well aware and qualified to carry out the role?-- That's correct. My recommendation would be at the bottom of each of those descriptions - an authority would state that if - when on holidays, there is a time period where maybe those duties should be shared. I mean, that if - I did most of the - I put together most of these position descriptions. That is another little paragraph that I would put into that, yes.

Now, as you have agreed, I think, the main assistance you gave to Allan Morieson is in the area of CO make and its

calculation for that panel; is that so?-----

MR MORRISON: No, he didn't say that.

MR MACSPORRAN: Well, that was one of the main areas you had experience in dealing with Morieson?-- That was one aspect, yes.

And, for obvious reasons here, an important aspect?-- Yes, yes, it is an important aspect, yes.

And you were aware back in - well, early, I suppose, around July, June/July, you were aware that the CO make inside 512 was an important matter?-- Yes, it is an important matter, yes.

And it's an important matter in the detection of spontaneous combustion?-- That's why that system was in place, yes.

You say it's the very reason why it's monitored?-- That is correct.

Because it can be an indication of a serious problem inside the mine?-- That is correct.

You know also, as I think you have said, that it's important to establish some sort of background to the CO make inside the panel to know what it might do in the future?-- We had just embarked on that idea at the beginning of that 512 Panel, that is correct.

And you have told us you had fairly extensive discussions with Allan Morieson about that very matter?-- We had discussions. I'm not sure if I would use "extensive" in that term.

Well, if you were going to assist Allan Morieson in looking after the CO make in 512, you would have to have extensive discussions with him, wouldn't you?-- Well, realistically, my hand in the 512 CO make monitoring was only the latter half - the latter end of the panel. I did not really - I wasn't there for the middle stage, the June/July, of that panel. That was really a job that Allan performed and was able to complete and do himself and hand it to the respective people. He didn't really need my assistance to produce those graphs.

Well, he did initially, didn't he? That's how you set up the system, so he could produce the graphs?-- Yes, that was in 19 - end of '92, yes.

Before -----?-- This is 1994, yes.

Well, you were absent, I think you have told us, between 16 June and 11 July?-- That is correct, yes.

Before you went away and at about the time extraction started in 512 you spoke with Morieson about what he expected to be the CO make for 512?-- That is correct, yes.

And were those discussions extensive?-- They were a question

that I asked Allan in the room. We were sitting down and I asked him, you know, what the chances were. If you would like to define "extensive", I could - you could put a time limit on it, I -----

Put it this way: did you consider it an important matter to discuss with him?-- It was an issue, yes.

An important issue?-- An issue.

You didn't consider it to be important?-- It was important but it was an issue. I was finding my way around the understanding of what was happening at Moura itself.

These discussions, however extensive they were, concerned establishing a background CO make to enable you to interpret the CO make that came out of 512 after extraction commenced?-- Yes, not only 512, the rest of the mine too, to get a background of what the rest of the mine was doing.

But we are dealing with 512?-- We are dealing with 512, that's correct.

And you have told us how 512 was a new system of extraction and that raised prospects of the CO make coming out of 512 being somewhat different from other panels?-- That is correct, yes.

And this was all discussed between yourself and Morieson?-- Yes, he said that - and in as broad a terms as this: the fact that the type of mining system, the take a row, leave a row, and the ramping would leave, you know, possibly a little more loose coal, yes. The other rib stripping systems of taking two sides of every pillar leaves quite a - we left quite a substantial remnant pillar, you know, as in the 511. The remnant pillar was of a dimension of 23 by 23 metres. There is a big difference between that being able to carry a load, a sandstone load, compared to a five metre fender that was left in the take a row, leave a row scenario.

All right. Now, coming back to the actual CO make itself?-- Yes.

These discussions with Morieson resulted, you think, in him saying that he expected a final CO make out of 512 to be about 14 lpm?-- That's correct, yes.

Based upon, he thought, a base figure of about 2?-- That's correct.

An increase per week of about 1 lpm per week?-- That is correct, yes.

Now, again, that was a very important matter, wasn't it, the behaviour of the CO make coming out of 512?-- It is an important matter, but we - he was only giving his opinion and I was - we were in the early throws of trying to understand what was happening.

So that you could closely monitor the CO make in 512 as extraction progressed?-- That is correct, yes.

So, you needed to know a base figure so you could properly interpret the data coming out of 512?-- That is correct, yes.

Because without that information or that investigation, the results coming out of 512 could be quite meaningless?-- They say with collecting data, rubbish in, rubbish out, yes.

So, you had also the basic guideline from Strang and Mackenzie-Wood's information or book?-- That is correct, yes.

A figure of between 10 - 10 requires you to take notice and possibly look into the situation?-- That is correct, yes.

And then 20 or over indicates a worsening and possibly dangerous situation?-- A possibly dangerous situation, yes.

Those figures are subject to the background of any given panel?-- That is the way we interpreted it for 512, that is correct.

So, again, the background you established - it's pretty important in terms of relating it to the base guidelines of 10 to 20 lpm?-- Yeah, we were trying to understand that, yes.

And the way you are trying to understand it was by yourself and Morieson having discussions about it?-- We discussed it at the early throws of the panel, yes.

And Morieson was a deputy?-- That is correct.

And a ventilation officer with some experience as a ventilation officer?-- Prior to me arriving there, he was a ventilation officer, that's correct.

And you had, I think you have conceded, at this stage we are talking about, very little experience in the area?-- In the area of mine gas analysis, that's correct, yes.

And that's why you weren't prepared to challenge any opinion that Morieson had because he was the more experienced of the two?-- That's correct, yes.

But Morieson himself wasn't an expert in either spontaneous combustion or assessing CO makes and establishing backgrounds of CO makes in panels, was he?-- No, but his 15 years' experience at No 2, I think, would have some standing in making that evaluation.

You have told us he was the one who advanced the theory that possibly you would expect a higher CO make from 512 because of the method of extraction?-- That is correct, yes.

But there was no - as I understand, from what you have told us, there was no attempt by either yourself or Morieson, to your knowledge, to further investigate that background in 512?-- At that stage, no, there was not, no.

Well, not at any stage?-- Not at any stage, no. If I can make the comparison with pillar design - and that's what I'm more familiar with - once you obtain information about criterias at the respective site - not in New South Wales and not up at Collinsville, but at Moura - then only can you make proper evaluations on what is actually happening at that mine. It is very difficult to take one system out of one area and place it into the next. So, it is all horses for courses, so to speak.

You are really agreeing with the proposition that this discussion leading to Morieson's assessment of what the make might be in 512 was very much based on not so much guesswork, but quite shaky ground, because you hadn't started extracting in 512?-- I won't deny that, no.

And that would lead you to the need, would it not, to very closely monitor the progress of a CO make after extraction commenced?-- It was closely monitored on a weekly basis.

But there was a continual belief that an increase in CO make inside 512 would relate to this different method of mining?-- That was the only fact that we had to go on, yes.

But you had no real scientific basis to hang your hat on that proposal, did you?-- Like I said before, no.

But it was continued to be said to be the cause of the increased CO make?-- Yes, that's correct.

Really without basis?-- I can only answer that in the affirmative, yes.

There were means at your disposal as early as just prior to the commencement of extraction to get some help - scientific help to determine the likely CO make coming out of 512?-- Yes, I was aware - would be aware of groups that could assist us in that sort of decision making, yes.

Can you just tell us briefly what sort of groups you would have had or could have had in mind as at April 1994 to assist you with this exercise?-- I mean, obviously the most - the first group to come to mind are the SIMTARS people.

SIMTARS?-- Yes. They could possibly help us, yes.

It was your experience as at April 1994 that SIMTARS were readily available and would have been, you'd expect, cooperative?-- If we had asked them about that particular issue, yes.

Your experience with SIMTARS was that they were prepared to help, if requested?-- I did not have any - I knew Col Hester, but only from knowing that he was on site occasionally, but no representatives had actually physically come to us and said, "This is what we can do for you." They didn't do that to me.

The point is that you understood, even then, that SIMTARS was available to assist if necessary. You could have gone to SIMTARS?-- The entire mine industry knows about SIMTARS, yes.

And appreciates their expertise?-- Yes.

You could also have gone to Dave Kerr?-- Yes.

Possibly as another person to approach?-- Yes, we could have, yes.

Your experience had been in some gassy mines in New South Wales, hadn't it?-- Technical experience from the sense that I was in that area.

You had been working in areas in New South Wales-----?-- Not technical, but just on a - the fact that that area was liable to spontaneous combustion, yes, that's all.

You had some relating to you by personnel at those mines of experiences they had had of spontaneous combustion and how they dealt with it?-- Yes, good stories, yes.

There would have been some experts, I suppose, in that area in New South Wales, if necessary, that you could approach to talk about this problem in 512 and its possible CO make?-- There would have been possible people, but I would not be able to recollect anyone in particular.

In any event, you didn't have to go past SIMTARS in Queensland, did you?-- No, if we want to get that information, no.

Furthermore, you also had available to you the considerable experience of George Mason, the undermanager in charge?-- That is correct, yes.

Who had had, as you knew, wide experience with mines subject to spontaneous combustion?-- Yeah, George had been at No 2 and No 4 for a long time, yes.

Had George been at Kianga as well?-- I think he had. I'm not 100 per cent sure. I can't remember.

You also had access to Albert Schaus, the manager?-- Yes, that's correct, Albert was there.

In any event, it is correct to say, isn't it, that you didn't approach - neither yourself nor Morieson approached any of those people we mentioned to try and sort out the problem with 512 - potential problem with 512?-- Not in its design stage, no.

By that you mean not in the assessment of what the CO make should be, or possibly could be that would come out of 512 during extraction?-- That is correct, yes.

Why? Why was there no step taken to more thoroughly determine what the CO make might have been in 512? Was it not considered important enough at that stage?-- At that stage, no. It was - I did not consider it.

Again, it is easy looking back on it?-- Very easy looking back on it, yes.

It is obviously a significant factor, isn't it - the behaviour of the CO make inside a panel?-- That is correct, yes.

In terms of detecting, in time, a possible spontaneous combustion?-- That is correct, yes.

And what happened here was there was some figure latched onto of 14 lpm as the expected level, and it was never addressed significantly again, was it?-- I'd like to clarify that.

Certainly?-- On the 22nd when we did go down with Dave Kerr, who was a very experienced person in that field, he at that stage again gave me no indication that the level that we were running at - the 5 to 6 parts in the top return - was of any concern. That gave me a comfort zone, if I can call it that. I was comfortable with the fact that Dave had been underground and he had not said anything about that.

And what made you comfortable with that was the fact that you relied upon, as you are entitled to do, Dave Kerr's considerable experience and expertise in the area?-- That's correct, yes.

But you know, don't you, that Dave Kerr didn't have the full facts about the behaviour prior to that time of 512?-- I did not know that. Obviously, from sitting in this Court, I was

not given the full facts either.

No. In fact, you were drawing comfort from Dave Kerr's lack of concern about 512?-- That is correct, yes.

Dave Kerr didn't know that there had been some sign, such as smells, reported prior to that time inside 512. You now know that?-- I now know that, yes.

You were drawing comfort yourself when you didn't know that there had been smells reported inside 512?-- I was unaware.

So, you and Dave Kerr were completely unconcerned about what was happening in 512, but didn't have the full facts?-- From this Inquiry, we understand that now, yes. At the time, it wasn't the case.

See, Mr Morrison asked you yesterday whether or not Dave Kerr, the person with the experience, had suggested any further investigation inside 512 on 22 July; remember that?-- That's correct, yes.

You said "no", that Dave Kerr had been satisfied with what he had found, there was no concern, and you came up from underground?-- That is correct, the three of us did.

But again, you see, Dave Kerr - one couldn't be critical of Dave Kerr not conducting a further investigation if one realises Dave Kerr did not have the full facts?-- I can understand that, yes.

With the facts that Dave Kerr had, and indeed you had, the investigation you conducted was more than adequate?-- At that time, yes, I thought - I went home that night feeling easy, yes.

Had you had the full picture, your behaviour and your investigation on 22 July may have been different?-- It might have been different.

And probably would have been?-- Yes, I think so.

You see, you have been taken through this I think by Mr Clair, but there were deputies' reports that indicated the signs inside 512 to be concerned about and, in summary, those were: smells, layering in the No 2 top supply road, recirculation in the same area - all of those features that had occurred prior to the 22nd of July, you have now been made aware of those features, haven't you?-- I have been, yes.

But you had no idea of any of that when you conducted your investigation on the 22nd?-- That is correct.

Just to return to the assessment of what the CO make should have been in 512, your recollection is that it was going to be about 14 by the time the extraction was completed?-- Yes, it was a best guess, like you said.

And that was based upon the discussions you had had with

Morieson?-- That is correct, yes.

Now, are you sure that Morieson said to you that it was going to be about 14 at the end of the panel's life as opposed to some other figure?-- No, no, the reason - it was a joint sort of discussion at that stage. I had given him the fact that we would be in the panel for 12 weeks, using the production schedule that I had developed, and with the two-----

All I'm simply asking is if you actually recollect Morieson telling you a figure of 14 as opposed to some other figure?-- No, no, 14 is the figure we talked about, yes.

See, I suggest to you that Morieson in evidence here gave a different figure. He said his assessment was a background figure or a starting figure, if you like, of 2 lpm in the second phase that work started, and a rate of increase which would leave a final figure of about 12 lpm at the end of the panel's life. Does that jog your memory at all?-- No, it does not.

You still recollect 14 as being the figure discussed by Morieson?-- The life of the panel being 12 weeks on extraction, at 1 litre per week, that's 12, plus the 2, making it 14.

All right. There is a difference, obviously, between 12 and 14 lpm in terms of the CO make at the end of the panel's life?-- I beg your pardon?

There is a difference between 12 and 14?-- It is like the grey area between 18 and 20.

And that is much more in the grey area than 12 and 14?-- Yes.

In any event, your recollection is it was 14, not any lower figure?-- Yes, that's what I recollect.

Once you determine whatever the figure was for an expected CO make, factors such as signs consistent with spontaneous combustion inside the panel would lead you to rethink such a figure, wouldn't it?-- For sure it would. If you are running at 5 lpm and if you had a stink and a haze and everything else, that would be a concern at that level.

Right. Well, again, I don't want to take you through all of the signs that had been reported, but there were signs you now know that were consistent with a spontaneous combustion inside 512 prior to July last year?-- There was indications that people had smelt something, yes.

Had you known that, would you have reassessed the figure you would have expected for CO make at the end of the panel's life?-- If I had known that, we would have just investigated a lot more thoroughly. Like I said, if we had 5 lpm in the CO make with a fire smell, well - or fire stink - you would investigate that. We would not have just evaluated the 14 as such.

No. In any event, you know now from the evidence here that Allan Morieson was aware of some signs because he had carried out some investigations with others prior to July last year?-- That is correct, yes.

But you're sure that Allan Morieson didn't raise with you any of those signs that he had been made aware of?-- No, he hadn't, actually.

And you were the person - the underground mining engineer who was, by position description, designated to assist Allan Morieson in his ventilation duties?-- Yes, in certain aspects, yes.

And with respect to the aspect of CO make, you could never assist him without knowing the facts?-- Like I said before, for quite a considerable period in 401, 402 and for a considerable period in 512, I had very little to do with regards Allan putting his information in and printing it out. You know, if I saw the graph, I did - if it came to my attention.

But in any event, relying upon an expected CO make because of a change in mining method would have to be reassessed in light of signs of spontaneous combustion coming out of the panel, wouldn't it?-- I beg your pardon? Could you repeat that?

You couldn't simply rely upon expected CO make because of a change in mining method if you had signs of spontaneous combustion coming out of the panel?-- No. Like I said, if you had signs of a spontaneous combustion - of a stink, as such, you would address that.

And perhaps reassess your estimate that the panel - end of the panel life would result in a CO make of 14 or 12, or whatever litres per minute?-- Yes, you would assess it and you would think about what was happening in the next couple of weeks as it progressed. You would watch it more carefully, yes.

You wouldn't sit back somewhat more relaxed and say any increase in CO make related to the different method of mining?-- You would have both sides of the story to that. If you had a concern, you would - I would try to identify it, if you could. If you couldn't, and you still got a rise in CO make, it still would have to be attributed to the mining system that you were currently using.

And you have mentioned something about the signs of spontaneous combustion, and you mentioned haze, smell, things of that kind, and you have been asked questions, I think, about the Graham's Ratio - ratio of carbon monoxide to oxygen deficiency?-- That's correct, yes.

And it is the fact that the time we are talking about here, back in August last year, you really had no knowledge of or attention to Graham's Ratio inside 512?-- No, I did not. I was aware of the number on the screen but I didn't associate that number with anything in particular, no.

You now know, of course, the way it can be used as a significant indicator potentially of a spontaneous combustion?-- It has been - in the literature it says it can be used, yes.

Now, you are aware of the formula used to calculate Graham's Ratio?-- No, I'm not aware of it. I wasn't aware of it at the time.

You are aware that the way it is done, as I understand it, is to have carbon monoxide divided by a figure, multiplied by nitrogen, minus the oxygen in the reading?-- Minus the oxygen, to give you an oxygen deficiency ratio.

And that formula, as you understand it now, would be fairly critically dependent on the reading of oxygen used to calculate it?-- That is correct.

Because any movement in the oxygen value will significantly effect the ultimate ratio figure achieved?-- That is correct, yes.

Now, the monitoring system inside 512 was capable of analysing the oxygen inside the panel, wasn't it, from samples -----?-- Sorry, is this the sealed panel we are talking about?

No, generally?-- Generally, yes. Generally you've got air flow past every monitoring point which therefore states normal air, you have oxygen.

That's why or that's how, if you like, the Graham's Ratio is able to be calculated on the Unor computer -----?-- On a continuous basis, yes.

Now, there seems to be a prospect that the Unor system was incorrectly reading the oxygen levels; have you heard that suggestion before today?-- I have heard that post the explosion, that's correct, yes.

And do you agree there is some evidence for that proposition in readings taken from the pump room on the surface?-- Beg your pardon, sorry? Could you repeat the question?

Perhaps I should ask you this in sequence: what would you expect to be the oxygen percentage in the normal atmosphere?-- You look at 20.9 as a -----

20.9?-- That's correct, yes.

That's in ordinary air?-- That's in ordinary air, that's correct.

There was a sampling point, wasn't there, in the Unor system in the pump room?-- In the pump room. Yes, there was a pump room -----

Point 14?-- That's correct, yes.

Ideally you would expect point 14 would be sampling oxygen from the ordinary air?-- Fresh air, yes, the freshest air.

You would expect the oxygen from point 14 to read pretty close to what you would expect in ordinary air, to be 20.9?-- I would assume that, yes.

Well, could the witness see - it's part of the SIMTARS report, Your Worship. I think it's volume 2 of the annexures to Exhibit 5?. Could I ask you to turn to - beg your pardon, it's volume 1. If you could turn to appendix - it's 2.1.71 in that volume. That's the data from point 14 pump room?-- That is correct, yes.

And you look at the oxygen values - I should say the data starts on 27 July?-- That is correct, yes.

And I think goes right through until after the explosion?-- That's correct, yes.

In fact the last entry is 10 August, is that so, that series of data?-- That is correct, yes.

You see the oxygen values fairly consistently throughout that whole period are well below what you would expect to be the normal of 20.9; is that so?-- Quite consistently between 20.4 and 20.6, yes, consistently throughout though.

And consistently below what you should have - or would expect to have of 20.9 or thereabouts because this is just the fresh air on the surface?-- That depends on your analyser. Obviously the analyser is consistent.

Consistent -----?-- Consistently between 20.4 and 20.6.

There may be another quite simple explanation for it all, but -----?-- There might be, yes.

One possibility is that the analyser is out of - the calibration on the analyser is inaccurate or in error by a small margin?-- A question I ask is is the analyser able to do it? I don't know.

I don't either?-- No.

If it was able to be calibrated it may well be that it's out of calibration perhaps. That's one explanation?-- That is one explanation, that is correct, yes.

In any event, if that is the explanation you would be having oxygen readings potentially lower than what they should have been throughout the mine?-- Yes, that's right.

And if the analyser is reading fresh air as being less than 20.9 you would expect it to be reading air mixed with other gases low as well?-- I could not comment on that, no.

It's certainly not that simple obviously, but that's a possible scenario?-- Possibility.

If the analyser is out of sync the oxygen levels are being read lower than they should have been?-- I can't comment on that, sorry.

And given the nature of the Graham's Ratio formula, if the oxygen is lower the Graham's Ratio will be lower too, won't it, because the deficiency is not as great?-- I haven't been able to study the Graham's Ratio as such. The deficiency -----

Well, if the bottom line of the equation -----?-- Is smaller you would expect a higher - a higher ratio.

Yes, the bottom level of the equation relates to taking away the amount of oxygen, doesn't it, subtracting from nitrogen the amount of oxygen. So if you can - taking away a smaller amount of oxygen on the reading you will have a higher bottom line and lower ratio?-- Is it your nitrogen minus your

oxygen?

Yes?-- Well -----

Then you would have a lower ratio?-- Then you would have a lower ratio, that is correct.

A lower Graham's Ratio potentially can mask a sign of a spontaneous combustion?-- I've not done the calculations, but .4 to .6 to .9, the .3 difference being the minimum, I don't know what sort of effect that would have on parts per million divided by such a difference of a small factor. That I have not analysed so I can't comment other than that.

We can possibly do that somewhere else, but would you agree that a possible result of an incorrect analysis of the oxygen level could be a lower Graham's Ratio, speaking in very general terms?-- Yes, the absolute value of Graham's Ratio could be lower, that is correct.

If you are looking at a Graham's Ratio in a sign of a heating, whatever the parameters are you could miss it if in the Graham's Ratio is lower than it should be?-- If I recall correctly, when Mr Clair gave me Mr Highton's report yesterday one of the things that he did establish in that report was a base case of Graham's Ratio needed to be identified so you could make that difference - so you could make that judgment.

I think he said, didn't he, that even very small fluctuations in Graham's Ratio would be considered to be significant in terms of detecting a spontaneous combustion?-- He did say that, but he also said to understand the background of - again understanding the background of your mine atmosphere.

While I'm on the point of Graham's Ratio, you were asked questions by Mr Morrison about was it your belief at the time that looking at a Graham's Ratio after a panel had been sealed was virtually useless?-- It was my impression that's correct, yes.

I think you agreed with the suggestion that that was a widely held belief at Moura?-- No, I didn't say that.

Sorry, you said you didn't know what other people believed?-- That's correct, that's what my belief was.

You now know, of course, from reading Mr Highton's report, that's not his opinion?-- It is not his opinion, but I would certainly have a lot of questions to ask him with regards that, yes.

You can see he is a fairly eminent man in the field?-- Yes, that's right, not that I would look to question, but look to get some proper answers.

Certainly, and his opinion expressed in the report tendered here has been that the sampling of the atmosphere behind the sealed panel is valid to determine Graham's Ratio for a period after sealing?-- That is what his opinion is in that report,

that's correct.

The evidence here, of course, indicates that for some hours after the panel was sealed the Graham's Ratio climbed quite rapidly. You know that now, don't you?-- Yes, it did, yes.

But the state of belief at the time at Moura No 2 was that such a ratio climbing significantly into the -----?-- But that would be a natural experience. With Moura's goafs predominantly being a methane existing goaf and the previous panel, the 511 panel, as I said before, within one week of sealing had fully - had just about pressurised. In other words the content of methane coming into that void in the 511 void was quite rapid. Now, I know that methane is lighter than oxygen, it goes to the roof and it can very - it does easily displace oxygen. So, you know, with your rising to the 10 per cent like we saw yesterday in the report - or between five and 10 per cent I should say, that's a point where the monitor was located in the top part of the panel.

I'm not debating with you, I'm simply saying that you now know that Mr Highton sees as significant the rise in Graham's Ratio after sealing inside a panel?-- That's his opinion, yes.

The state of belief at Moura No 2 at the time the panel was sealed was that the Graham's Ratio was virtually meaningless and not to be looked at?-- I cannot comment on that. I can only comment on my own -----

It was your belief?-- It was my belief, that's correct, yes.

On that point of monitoring a sealed area, again looking back on it in hindsight, it's desirable, isn't it, to have a more efficient and representative sampling of a sealed area?-- Yes, yes, a sampling - representative sampling in the panels which had been done on every occasion, yes.

Here you had a large area that was being sealed perhaps not by comparison -----?-- No, not by comparison to other areas in the mine.

But certainly a large area generally, a large goaf area being sealed off?-- We will qualify that; 400 metres by 167 metres.

However we categorise that they were the dimensions of the area you were sealing?-- That was the dimensions, yes.

To monitor the gases inside that sealed area there was one monitor point placed inbye the seals?-- I am led to believe that that's what occurred, yes.

And that was about 20 or so metres inbye of the seal area?-- That is correct, yes.

And I think the belt or No 3 road?-- In the belt road, yes.

And that was designed to sample the atmosphere behind the seals in a panel that was 400 metres long?-- That is what eventuated, yes.

It would be more appropriate, looking back on it now, to have had points further inbye and more of them if that was possible?-- That might be a standard that you could recommend, yes.

And you certainly, having seen the evidence here, you would be prepared to recommend yourself such a proposal?-- Horses for courses. Like I said before, predominantly our goafs fill up with methane but, yes, it would be desirable to have a significant number of points whether it be in just the top return or whether it be in the goaf or whether it be surface boreholes. I mean those sort of issues I think are important issues that could be addressed by this Inquiry.

I want to then move to 22 July which is the day that there was a concern about a high reading taken by Steve Bryon?-- That is correct, yes.

You've been taken through several times now all of these things, but I ask you this: as I understand what you've told us you didn't know that there had been a directive issued by George Mason, the undermanager in charge, to take daily readings after 22 July?-- No, I was not aware of a notice put up to the deputies.

You thought the system had changed after that fright, if you like, on the 22nd, but only to the extent of taking the readings on the weekend and keeping an eye on it?-- That is correct, yes, and I was of that belief the week before the explosion just looking quickly at the blue folder.

So at no stage did you understand before the explosion and after 22 July that the deputies were taking shift by shift readings of all of these relevant points?-- Not on a shift by shift basis, no.

Or even on a daily basis?-- Even on a daily basis. I only acquired that knowledge while I was sitting here in Court.

And, of course, the whole system you now know had been changed to enable a closer monitoring of the CO make?-- A system had been put in place that weekend to watch the - to monitor the CO make.

Which you as the person assisting the ventilation officer had no idea of?-- The weekend - that particular weekend I was aware.

After the weekend, I should -----?-- After that I - I wasn't in the habit of - it wasn't my habit of reading - continually reading through all deputies' reports. I would only read selective ones.

And in fact I think you told us that before Friday the 5th of August there were just no discussions involving yourself or anybody else in your presence about the CO make and what it was doing?-- There was none, no.

And you now know, don't you, that the CO make was increasing?-- Yes. The results taken from the 29th showed a slight increase which I expected, and then the results on Friday the 5th also showed an increase which I expected, and when you looked at the graph on the 5th, discount - not discounting, but looking at - taking out the peaks and troughs in that system the CO make was constantly rising for that week, but that was - that was looking at it on Friday the 5th.

And before that Friday, as you've told us several times now, you had no idea there had been ventilation problems inside 512?-- I was unaware of them, that's correct.

But you were told something about that by Mr Schaus on the Friday morning?-- That's correct, yes.

And that was before you plotted the graph for the 5th, the Friday afternoon?-- That is correct, yes.

Well, didn't that concern you that there had been some ventilation problems inside 512 in terms of CO make?-- No, it didn't cause me any problems. It's nearly - in the design of the ventilation of 512 the stoppings between 12 and cut-through have all got doors constructed in them. Those doors are specifically there so that that bottom triangle, if it does become difficult to ventilate for whatever reason, can be physically rolled up and that's why the inspection route, and then air would pass through that triangle, more air would pass through that triangle. That was the extent of the problem I thought was in that panel.

To be fair to you and to be accurate about it, you even then that Friday morning were not told about smells and re-circulation and layering in No 2 heading?-- No, Albert did say that there was some methane coming up No 2 heading which was a natural part of that triangle being poorly ventilated, but, you know, by physically - we had never put a hole or a door of any type on the top return as such. Since I have found out that Allan actually did. He did put one at 12 cut-through and I think one at 11 to assist the ventilation in that bottom - that very bottom corner and that was quite a sensible idea, I think.

In any event you told us that what you were looking for is some sort of sharp increase in CO make?-- That is correct, yes.

Was it a sharp increase in CO make or a sharp increase in parts per million or both?-- It's a combination of both. The make on the graph as we had the 18 or the 19, was a point of concern for me, but the point of concern when we only rose one part when there was only one fan operation wasn't a concern to me.

WARDEN: Excuse me, Mr Macsporran, unless you are nearly finished we will take a break.

MR MACSPORRAN: I won't be long, but not five minutes.

WARDEN: We will have the morning adjournment now.

THE COURT ADJOURNED AT 11 A.M.

THE COURT RESUMED AT 11.16 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MACSPORRAN: Mr Abrahamse, I was just about to come to the events of 22 July. Before we deal with that, can I take you back very briefly to some evidence you gave this morning and just a moment ago about layering in the No 2 heading?-- That is correct, yes.

I think you told us that Mr Schaus had informed you on the morning of Friday the 5th that there had been a problem in the gases or air coming back up the No 2 heading and it had to be dealt with?-- That is correct, yes.

And that was the first you had learnt of that difficulty with the ventilation inside 512?-- On Friday the 5th, that's correct.

The first you knew of it?-- The first I knew specifically what that problem was.

And were you told when that had happened, when the problem had been encountered inside 512?-- No, it had come to my recollection that when I - while I was on holidays I had contacted Albert about some budget matter that I cannot remember, and he made mention that taking of the sequence on the uphill - they had taken the sequence on the uphill and had some ventilation problems, and then I said to him - I said, "Well, maybe we should, you know, just close that bottom return down, you know, altogether."

So, this is when you were on holidays between 16 June and 11 July?-- That is correct, yes.

Can you now recollect at what stage of your holiday it was that you had the phone call with him, towards the end, the beginning, the middle?-- No, all I remember is that I was at my wife's bedside in hospital.

Does that help you pinpoint when it was in that period?-- No, it doesn't, no.

In any event, it was to do with that same sort of problem. Your spoke more about it, or specifically about it on 5 August, the Friday?-- I asked the question what had happened to the stoppings down the bottom. That was his answer, just that dead triangle - the possibility of the dead triangle and flushing that corner, and that was quite a reasonable -----

I think you have said in evidence that there had been a problem with methane layering in other panels?-- That is - in the - yes, that's correct, yes, I did.

401/402?-- No, not 401/402, did I?

Not sure?-- No. I remember the 5 South.

5 South?-- And the possibility - I don't recollect exactly if methane was coming up No 1 heading in the 4 South level, but I know that No 1 heading in the 4 South level was - had a slower - had a slow velocity down that heading. The stone dust travelling in the 5 South was what I recollect, the ventilation coming back.

Was there a problem in 5 South on that Friday with layering?-- There was - at the end of the day I found out there was some layering in the 520 on the 5th.

That's the stub, I think, off the end of 5 South?-- Down dip, that's correct.

That was dealt with on the 5th by a change in the regulator, was it, the regulators?-- So I was led to believe, yes.

Designed to flush out any build-up of methane?-- That's correct, yes.

Does it strike you as being odd that you weren't called in to deal with or assist in dealing with a layering problem inside 512?-- No, that really was well and truly out of my scope, yes.

You wouldn't consider that to be part of your role in assisting Morieson with ventilation matters, to deal with layering in the heading?-- No, the undermanagers are more than adequate in that field to handle that sort of situation.

It's the case, isn't it, that layering can be a problem in terms of detecting the actual atmosphere, the actual concentration of gas?-- That is correct, yes.

The very fact of layering can mean it misses going into a monitor point or being sampled by, for instance, a Unor system?-- A possibility, yes.

And, of course, that creates a very real problem with safety, doesn't it?-- It's an industrial problem when you work on dips like we do with the high methane quantity in your coal seam, yes.

One way to deal with it, as it was done - you were told it was done in the 520 area, was to alter the ventilation in some form or other to flush out the layering?-- That is correct, yes, in the morning, yes.

Once that's done, it would be advisable, wouldn't it, to investigate the source of the methane creating the layer?-- The source - I'm not sure. You would have to look at the deputies' reports for the night shift or the day shift, whichever it was reported, but you would - the person that would have identified the problem would have also - I assume would have located the source.

Well, you would expect that because it would be - the natural thing to do once you had found layering would be to trace its source?-- Yes.

Because the layering itself can be an indication of a heating?-- Beg your pardon, sorry?

The layering effect, that is, the mixture coming up the roadway at the roof level, can be an indication of a heating further inbye?-- In the 520 panel?

No, no, in any panel. A layering effect can be consistent with a heating taking place inbye of the layer?-- That is one possibility, but methane has - with its relative density being .55, its natural tendency is to find its way to the roof. So, saying that it specifically related to a heating is not absolutely true.

I didn't say that. I said it's a factor that is consistent with a heating occurring inbye?-- No, no, sorry, no.

In any event, if you found layering, you would be keen to identify the source of it so you could deal with it?-- I would, yes. Well, if I was - a deputy would do that, that would be part of his role, yes.

And when I refer to ascertaining the source of it, I don't mean where it's occurring in the roof level, I mean tracing it back to some area?-- That is correct, yes.

And that would be good mining practice, to trace the source of a layering problem?-- That is the role of a safety officer, yes.

And once you had established the source was perhaps quite innocent, the next step you would take would be to flush out the build-up of methane?-- There were a lot of things that could have possibly occurred in 520 panel, yes. I could give a few reasons here myself, but whether I am absolutely correct, I don't know.

As we have established, you weren't told about the layering problem inside 512 specifically until the Friday the 5th?-- That is correct, yes.

It was put to you yesterday that Mr Morieson had successfully flushed the goaf area in 512 on 11 June, I think it was; you remember that?-- Yes, I do remember that, yes.

And that seems to have related to a layering problem at that locality?-- From understanding at the Inquiry, yes, that is what occurred.

Now, if you accept that the following week, 17 June, the same problem occurred at about the same locality - that is, a layering problem - a recirculation problem in the No 2 heading - what would that indicate to you? I know you don't have the full facts-----?-- No, that's right. One of the things is just the fact that the velocity would not be travelling enough - there would not be enough velocity travelling down No 2 heading to physically get right down to the end of the panel.

You associate that problem on 17 June with a slight smell consistent with a heating?-- Sorry, are you putting these assumptions to me now?

Yes?-- Well, like I said, if you had 5 lpm CO make and you had a smell, it should be investigated.

So, are you saying the action you would take is not simply to flush the area again; you would carry out a further investigation to try and locate the source of the smell and layering?-- If a source - if a smell was registered by somebody, that would be the first thing that you would try to do, yes, to identify where that smell was coming from.

And what would a smell of that kind associated with layering mean to you, if anything?-- A smell would indicate that there is a possible heating and layering, indicating to me that the velocity at that point - in the heading where the layering was occurring - was insufficient to take that methane away.

Now, in terms of the action taken to correct such a situation, if you flush it, the idea being to dissipate the build-up of methane; is that so?-- To flush the methane?

Yes?-- That is one - by introducing more into that section, you would create more turbulence to remove the layering from the roof.

As we said earlier, if you have a problem such as layering identified, the difficulty you face is that your Unor monitoring system may not be picking up anywhere near the amount of concentration of methane, and possibly other gases in the goaf; is that so?-- Yes, that's true to say if you had methane travelling the entire 400 metres - that's quite a substantial length. I have not - I haven't been - I haven't faced any of those problems where layering has occurred to extensive lengths, but that's what I would assume.

And you have read Mr Highton's report?-- No, I haven't.

Are you aware of any comments that he makes in the report of what you have heard of it - anything?-- About?

About the difficulty with the layering masking the true atmosphere in a panel?-- The closest I got to Mr Highton's report was with Mr Clair yesterday. I tried to keep those notes and those figures out of my head so that I could be a true witness for what I knew pre the explosion.

I think you have conceded that other gases apart from methane

may be masked in the layering problem. You might have increased carbon monoxide, for instance, in such a layer?-- No. Carbon monoxide is of fairly close relative density to air, so I would expect that general body-----

If carbon monoxide is being given off during a heating process of coal, it would rise, wouldn't it?-- No, carbon monoxide's relative density is roughly the same as air, so it would be a general body. It is not like a layering of methane of .55, or carbon dioxide that is significantly heavier and lays on the floor.

The general body through the process of heating would tend to rise?-- The general atmosphere of the goaf?

Would tend to rise with the heating?-- With heat - with a heating or heat, sorry?

Do you get heat from a heating?-- You can get heat from a heating in an isolated location. Like I said before, we are looking at a goaf that is 400 by 180 metres wide, so - sorry, could you clarify that?

Could you have products of such a heating sitting on the roof of a panel and not being monitored accurately by the Unor system such as 512 had?-- If the velocities were not - were of - if you had low velocities, there is a possibility that you would have build-up, yes, of concentrations in the goaf, yes.

Perhaps whatever the velocity was, if it wasn't sufficient, you could have this build-up?-- There is a possibility of that, yes - a good possibility of that, yes.

We know the velocity at least at times was not sufficient, because there was layering occurring in the No 2 heading in 512?-- From what I understand now there was a possibility of that, but we maintained a quantity of at least 40 cubic metres through the panel, even though it wasn't consistent, which was a - which is a significant quantity that runs through any goaf which has a dimension of 400 metres by 160 metres.

But in spite of that significant air flow, layering was occurring in 512, No 2 heading, wasn't it, from what you have been told?-- From what I have been told, and I assume that by opening up the No 12 stopping and the No 11 stopping that that eliminated that problem. I can't say exactly, because I wasn't aware and I didn't take note of that post - pre the explosion.

All I'm suggesting is that if you have evidence of such layering, it is possible there could be, in addition to that layering of methane, a build-up of a product of a heating in the same way, the velocity not being sufficient to deal with it?-- But your carbon monoxide would be a general body reading, and if it was a general body reading, you would assume that the flow would be enough to carry it throughout the pit. I'm not saying that you wouldn't have large build-ups - possible large build-ups like the example that

Mr Highton gave that where inbye of the stopping he obtained, I think, 4,500 parts just inbye of a stopping - I'm not saying that that's not possible.

No, that's the potential difficulty?-- That's the potential of a heating, yes.

You hadn't read that in Mr Highton's report?-- No, Mr Clair ran that through me yesterday, or the day before.

That's the difficulty, isn't it? It is possible if your ventilation is not accurate, even though apparently the quantity looks adequate - if it is not, in fact, adequate, you can have a build-up which won't be picked up by the Unor system?-- That is possible, yes.

Now, I want to take you back to the information that was being gathered after the 22nd of July. We went through before the fact that you didn't really discuss the CO make after that time until the 5th, I think - the Friday - when you plotted-----?-- There were a number of occasions when I plotted it. The first occasion was on the Monday, when I looked at the-----

The 25th?-- The 25th - Monday the 25th, that's correct.

And the 29th?-- Not on - I plotted the result of the 29th on the 1st.

That's the week you came back?-- That's the week I came back, that is correct, and there was a slight rise in the CO make, yes.

Then you plotted it finally on the 5th, I think?-- That's correct, yes.

And discussed with Morieson the results?-- No, I did not discuss the results with Mr Morieson.

Didn't he return to work on the 5th?-- He returned to work on the 5th, yes, that's correct.

In any event, at no stage between the 29th and the 5th did you plot any graph for CO make?-- Sorry, I beg your pardon?

At no stage between the 29th - or 1 August and the 5th did you plot any further graph of the CO make?-- No, I did not, no.

Because you didn't know the deputies were still taking readings shift by shift?-- That is correct. I said in previous statements that I saw this log in the blue folder, opened it, saw that there were readings just one day past the day I was there and then closed the log again.

All right. Could the witness see Exhibit - I think it is 152, Your Worship?

I think it is a synopsis of evidence, is it? Is that the one?-- I've not seen this before.

Yeah, 152, is that the one you have got. Have you got the tabulation there as part of that exhibit?-- I've got a couple of graphs - yes, a make for the 512 panel.

There is a table there that talks about or records in log form, similar to the way you were doing it for the CO make, information by way of dates, deputy, shift, and all of the details you had required to plot a CO make; is that so?-- Yes, I am aware of this. This was made up when we found out about the log, yes.

Yes. And this table uses a Maihak reading to correspond with a Drager reading taken by the deputies on each of those shifts; is that so?-- That is correct, yes.

And then the final column, or the second last column records the actual make calculated using the deputies' Drager and obviously the deputies' velocity readings; is that so?-- I'm not aware of that. Is it the Maihak or the deputies'?

It says CO make Drager litres per minute?-- Oh, beg your pardon, CO make, Drager.

Yes. It apparently seems to relate to calculation of CO make using the Drager reading?-- Using the deputies' reports, yes.

And figures are set out from 23 July through to 6 August?-- That is correct, yes.

Now, you haven't at any stage - or have you - plotted a graph of those readings through that period?-- Pre or post?

Post?-- No, I have not.

You said that what you were concerned to look for was a sharp increase in both parts per million and CO make?-- That is correct, yes.

That's to alert you to the presence of - a possible presence of spontaneous combustion?-- A possible problem, yes.

And a CO make in litres per minute would be more reliable, because it takes into account velocity as well as parts per million, doesn't it?-- That is correct.

You could have a high parts per million with a low velocity that may give you a slightly lower make?-- You would get a lower make, yes, that's right, or incorrect make.

So, the advantage of the litres per minute or CO make figure is that it takes into account the variable of velocity or air flow inside the panel?-- That is the function of the CO make formula, that is correct, yes.

Which makes it an accurate, or more accurate measure of what's going on inside a panel than simply parts per million; is that so?-- That's what was - the system that was used at Moura, yes.

That's why the system changed, apparently, we are told, in 1987 from placing reliance on parts per million CO to a calculation of CO make in litres per minute?-- I'm led to believe that that's correct.

Could I ask you to have a look at this document, please?-- Am I finished with this?

Certainly. You might just leave that with you for the moment, but certainly put it to one side. I want you to look at that document. Firstly, I want you to look at the front page which is meant to indicate the source of the data that's used as part of that exhibit, or what is the intended exhibit. Do you see that?-- Yes, I do.

It might be a little hard to read across without the lines, but can I suggest to you - if you don't agree, please tell me - that what this tabulation uses is a combination of information which is set out on that sheet; is that so?-- There is a heck of a lot of information on this sheet, yes.

It starts from 28 February 1994 and goes through until 6 August 1994?-- That is correct, yes.

And records readings of parts per million, carbon monoxide; is that so?-- Parts per million, yes.

Velocity?-- Methane, velocity, yes.

No, methane reading, and then the next column is velocity in metres per second?-- That's correct.

Then air quantity in cubic metres per second?-- Are we going right across or are you just jumping-----

I am going from left to right, starting with parts per million, ending up with CO make litres per minute?-- Yes, you have 512 top return and bottom return. Which one are you looking at?

Straight across the sheet?-- Yes, but the top return or the bottom return columns?

It doesn't matter. They are both recorded, aren't they - both returns are recorded?-- Yes, they are.

As they would be to make a calculation of CO make; is that right?-- It is just a little bit confusing, the table.

Well, I'll go back to the left then. 28 February you have bottom return readings of parts per million CO?-- That is correct.

Percentage methane?-- That's correct.

Velocity metres per second?-- That's correct.

Top return parts per million CO?-- That's correct.

Percentage methane?-- Correct.

Volume metres per second?-- Correct.

Air quantity cubic metres per second?-- Correct. For a matter of interest, which one does that relate to? Which velocity?

Well, in any event the calculation results in a litres per minute as calculated, doesn't it?-- That is the next column, yes.

And then finally litres per minute of make as reported?-- That is what it has on the columns, yes, yes.

On the right-hand side of the page going across again from left to right you have the source of the data that's used on the left; is that right?-- That is correct, yes.

And there is the spread sheets referred to that you had compiled as a log, that's the spread sheet FB700/010?-- That's correct.

Then the next column is top return gas data source?-- Correct.

And that relates to Unor daily average?-- That's correct, yes.

Then Unor shift average moving down the column?-- Daily and shift, that's correct, yes.

That whole column of top return gas data is compiled using the Unor system with either daily or shift averages?-- That is what it says, yes.

The velocity source commences using the spread sheet that you and Morieson had contact with?-- That's correct.

And then after 22 July, I think it is, uses the information from the deputies' reports which are numbered?-- That is correct. Three numbers - sorry, all number reports, yes.

So for the period 22 or 23 July through to 6 August the source of the information has been the Unor system with daily or shift averages and the deputies' reports for velocities?-- From date did you say?

I think it's around about 22 or 23 July?-- The first shift

average is the 23rd.

And then those shift averages are used from that point right through until 6 August?-- That is correct.

Except for the last one, I should add, which is 6 August at the time 2030 which is 8.30 in the evening on the Saturday night?-- That is correct, yes.

Which is the reading Mr Tuffs took?-- Yes.

Having been taken at 8.30 it apparently is possible to ascertain the Unor point value at about that time?-- Yes, would be, yes.

So that actual point value is being used as opposed to the other shift averages on the Unor. Do you understand that?-- I understand that, yes.

That's the first sheet. Now, the next sheet is a plotting of some data and you see that the graph really is a plotting of information from, in effect, the start of extraction in late April 1994 through to 6 August?-- That is the dates, yes.

You see from the legend that - I think it's the orange -----?-- Can you just look at something, thank you, before you go on?

Yes?-- Yes?

Were you checking the date of extraction, were you?-- Yes.

29 April or thereabouts?-- That's correct, yes.

It starts from there and goes through until 6 August; is that so?-- That is correct, yes.

Now, the orange plots that you see refer to the CO make said to be BHP as at 5 August 1994?-- Sorry, you are going to have to bear with me for a while here. My colours are not the best. Go on.

The orange one you see there shows -----?-- With the square in the middle?

Yep, the orange one, the squares?-- Yes.

Goes through from around about 29 April through to 6 August showing a generally upward trend; is that so?-- That is correct, yes.

There are peaks and troughs, but would you agree that generally you could put a straight line which would move upwards and to your right for the BHP information up to 5 August?-- That is correct, yes.

You say, I suppose - or have said that that upward trend was not sharp so as to cause you alarm in terms of the CO make rate of increase?-- This was one of our best production

panels that we ever had. I mean we averaged - the data that's been given to the inspectors indicated we produced on average over that time 785 tonnes per shift - per unit shift that we had in there. I mean I only had ever scheduled 620 maximum. I mean there were times - months that we had 800 tonnes and in the last month 900 tonnes a unit shift, so we were producing at a very good rate, at the best rate that we had. I just wanted to make that clear.

Does that have relevance in terms of the slope of the graph though?-- In context to the extraction system that we had I think it does, yes.

Are you going back to the proposition that the method of mining explains the increase in CO make?-- That is correct, yes.

But you know now that's been somewhat discredited, that theory, hasn't it, by Mr Highton in his report?-- I've not read that, but that's his opinion.

In any event, you see then the green line, if you like, is in fact the line that's put through those orange plottings?-- Righto, yes.

In other words the green line is the straight line that best fits the peaks and troughs of the BHP information for CO make?-- Can I ask a question?

Sorry, I had that wrong myself. I apologise. The green line refers to all data which is the blue plottings, shows the slope of the increase related to the blue plottings, right?-- Related to the blue?

Yes?-- Does it, yeah.

The next one is the blue plottings, do you see that?-- Yes, I do, yes. With the blue box?

Yes, and that is a plotting from 29 April through to 6 August of all the data assembled?-- Righto, okay, yes.

And as we established before it uses the deputies' reports from 23 July through to 6 August and the velocities recorded by them?-- Well, I'll take your word for it, yes.

And uses the Unor system shift averages for those same deputies shifts?-- Yes, I can't argue with you, yes.

What do you say about the rate of increase as plotted using that information, the rate of increase of the CO make using that information?-- It's just - it's nearly the same realistically.

Are you looking at the blue plottings at the end of the period?-- No - well, the only difference being the very last part of that graph.

Well, the last part of that graph is the period -----?-- Is

between, say, 6 August, and if that's a week period I'd say the last three days to be precise. Otherwise I'd say that they were fairly well - fairly similar.

Even you would concede, would you, that the three days or so before 6 August the trend went markedly up?-- Yes, I would, yes.

And in fact if you look at the whole period from 23 July through to 6 August that is the trend, isn't it?-- There is a very stable flattening trend which we identified and then from that mid week it climbed, yes.

Now, such a graph was never plotted, was it?-- No, it wasn't.

Easier to look back perhaps, but looking at that what would you surmise was happening inside 512 as at 6 August?-- At 6 August past the 16 mark you would want to look at it and investigate it. There was a rise.

Well, that is even indicative of what you say you were looking for, the sharp increase?-- Yes. My understanding of a sharp increase as made reference to the 5 North was the vertical line which is on 6 August, a really sharp - I mean that's sharp.

This is sharp, isn't it?-- That line would be as sharp as, say, between - when that high reading was obtained on 11 June to identify that peak as well. Yeah, I'm not saying that it's not sharp, but I'm trying to put it into context.

It's certainly a matter that had you seen it on the 6th you would have carried out further investigations; is that so?-- We would have looked into it, I'm sure.

It would have been a matter of some considerable concern?-- Yes, the 16 litres itself is - to look into.

If you look at the next sheet you will see that's an enlargement, if you like, of the period, 23 July through to 8 August. Do you see that?-- That's correct, yes.

And you see the red line is the actual data that had been plotted as at 5 August?-- That's the red line with the red box in it?

Yes. Now firstly do you agree that shows an upward trend?-- Yes, it does, yes.

A continuing upward trend?-- A continual upward trend, yes.

As early as 23 July; is that right?-- Yes, it is. That's right, we were in extraction mode at that time.

Those were the actual graphs that you had plotted, aren't they?-- That is correct, yes.

30 July or thereabouts and then finally 5 August. That's the information you had and had used?-- That is correct, yes.

Then above that you have the blue lines again; is that so?-- That is correct, yes.

That refers to the actual deputies' reports for velocity and the Unor shift averages?-- That is correct, yes.

Which shows a fairly steep increase in CO make from the 23rd - well, certainly from 2 August on, doesn't it?-- From 2 August on, that's correct, yes.

Culminating in Tuffs' reading of - on the evening of the 6th at about 25 or thereabouts litres per minute?-- I would just like to make one comment on the Mr Tuffs' reading.

Yes?-- That was the very last recorded reading of that section and that is why I put that into the log document, being the very last.

It was after sealing had commenced?-- No, that was post sealing.

This is 8.30 on the Saturday night?-- I'm saying the log that I had produced with the 16 -----

The log you produced was post sealing?-- Was post sealing and Mr Tuffs' reading was the last reading that I was aware of and that's why I used that particular result.

You can see the trend though is borne out by Tuffs' deputy's report 3775 which is in excess of 20 lpm, comes back on 3776 to about 18 or 17.6 litres per minute or thereabouts and goes up to Tuffs' 25?-- Tuffs at 25?

Yes?-- Tuffs was 16.66.

Even ignoring Tuffs, the trend you've got -----?-- That makes a big difference to that graph, the appearance of that graph.

Well, if you take then the line of best fit which is the green line for that same graph, do you have that there?-- Yes, I can see that, the single line, yes.

That shows a fairly significant increasing trend, doesn't it?-- It shows an increasing trend, yes.

You see the Tuffs' reading at 6 August, 2030 which is 8.30 Saturday night?-- Sorry, where are you? On the front sheet, are you?

Yes, the front sheet, just the data sheet?-- The very last reading.

Can you see the CO parts per million 512 top return is 10.5; is that right?-- Just one moment.

The very last entry, Mr Abrahamse?-- Sorry, the 10 parts that you obtained in the top return is a point value from the Unor.

Tuffs took his reading at 8.30 Saturday night, didn't he?-- That is correct, and he recorded a 7 ppm. That's what I have logged on -----

That's how you get 16?-- That is correct, yes.

But if you take the Unor reading for the same time or thereabouts the Unor was reading 10.5 ppm?-- At a velocity of 1.81.

Yes, and apparently that calculates out to 25 lpm?-- So we will use Mr Tuffs' spot reading and the Unor value, not the actual value that he measured underground; is that correct?

Yes, to be consistent with the information supplied here. Anyway you have some problem with that, do you?-- I do, yes.

Do you see that the green line which is the line of best fit up to 3774 shows an increasing trend upward?-- Yes, I do.

And a trend upward to cause you some concern?-- Yes, it would, yes.

Had you seen it?-- Had I seen it? Yes.

Your Worship, I tender that series of documents.

WARDEN: Admitted and marked Exhibit 158.

ADMITTED AND MARKED "EXHIBIT 158"

MR MORRISON: Can I just mention one thing? I don't object to its tender, obviously someone is going to prove this in due course and tell us about it, but I ask our learned friend Mr MacSporran clear up at some stage before we talk to the person who produced the document the source for the shift average? It's been described as a Unor shift average. To my knowledge the Unor doesn't give you a shift average. So what I'm confused about is on that schedule you will notice times inserted which suggest that the spot reading for Unor might have been taken at the times indicated in the second column which seem to be start of shift times. I don't know if that's right or not. If it's someone who has just added up a lot of values can we know that? If so, which values so we can make some sense of at least that aspect of it. In due course, I don't need it right now.

MR MACSPORRAN: I am happy to do that. It will be proved in due course obviously. Mr Abrahamse, can I take you quickly to a couple of matters? Can I ask you generally how you would describe your relationship with the inspectorate?-- I thought I had - being a nice small team I think I had the luxury of, being a fairly sort of recent engineer at a mine site, to be able to have some association with the inspectorate, Mr Walker in particular. I knew Mr McMaster. Mr Mackie to a lesser degree. I knew of him, but to a lesser degree.

But you had a good working relationship with them?-- Yes, I did.

There was never a problem approaching them about any concern you had or matter you wanted clarified?-- No, no. We got on very well, I think. In my view we did.

Now, you have been asked some questions about the time when the documents were taken by the Inspectorate after the incident?-- That is correct, yes.

Now, what happened was this, wasn't it, that the incident team, which included most of the relevant inspectors, came to the mine site and requested they be given all relevant information about the incident?-- They requested a mass of information, that is correct.

But they asked to be produced to them all relevant information dealing with the incident and running of the mine generally?-- That's correct, yes.

I mean, that's to be distinguished from the Inspectorate coming to the mine site and conducting a search of the premises and seizing documents?-- No, they did not conduct a search -----

Search and seize?-- Search and seize operation, no.

Neither would you have expected them to have done that?-- No, I would not.

The relationship was such that they came there and requested the information and were given quantities of information?-- Beyond the realms of what people can sift through, yes.

And at no stage that you saw was there any search or inspection carried out by the Inspectorate of documents at the site?-- No, there was no search. Alan and Mike had set themselves up in the training room conducting - while Mike was conducting interviews there were - while conducting interviews with personnel, questions would be asked and then sources of information would be requested, and that was sort of an ongoing - on an ongoing basis for quite a considerable period of time, and that information was given - the request was given from the Department to Albert, the manager, and he then in turn delegated that information to the rest of his departments. I was one of the delegated people.

Just a final point: did you ever receive any training or refresher training at No 2 dealing with the signs of spontaneous combustion generally?-- Not that I can recall, not on specifically spontaneous combustion.

I think you mentioned having a library that you put together yourself with various publications?-- Yes, I had a bookshelf with some books.

Was that the extent; it was self-education, if you like, about this phenomenon?-- It was self-education about all aspects,

conveyor belts, mining systems, pillar design and so on.

As opposed to a training program run at the mine for personnel?-- That is correct, yes.

Thank you, Your Worship.

CROSS-EXAMINATION:

MR MARTIN: Mr Abrahamse, you, firstly, were a graduate engineer at BHP at Moura?-- That is correct, yes.

And you then joined the management team?-- That is correct, yes.

When?-- When?

Yes, please?-- Well, basically when you join the graduate team when I started at BHP Australia Coal, you are basically an official at that stage of your career.

All right. Well, is it fair for me to say that you were part of the management team from the time you first got there as a graduate engineer?-- I considered myself as, yes.

But certainly there would be no argument about it from the time you had fulfilled your graduate period and were put on, as it were, permanent staff as mining engineer?-- My title came as - if I got any letters from Brisbane or anywhere else it had graduate engineer on there, but being a little bit older than a lot of graduate engineers, I just accepted the responsibility of being part of the management team.

So, before the explosion you had, what, 18 months to two years or what period of time as part of management?-- Well, from the beginning of my graduate scheme.

Just what date approximately?-- I started '91 - February '92 I started at Moura.

After you received your degree from Wollongong, did you become a member of a professional institute particularly relating to engineering?-- Yes, as a student I joined the Australian Institute of Mining and Metallurgy and I remained as a student for some significant time after that until I joined BHP.

And did you remain a member of a professional institute after you joined BHP?-- I still currently am, that is correct.

Did you receive periodic literature?-- On a monthly basis, yes.

Relating to coal mining - some relating to coal mining?-- Related to mining would be a more apt term. It was metal, coal and -----

Some relating to coal mining?-- Some related to coal mining, that's correct.

Some relating to spontaneous combustion?-- I can't recall any specific papers. There was an Australian coal journal that used to come to the - to No 2 underground and there was a specific paper in that with regards spontaneous combustion, yes.

Before August 1994?-- That is correct, yes.

And the literature received from your professional institute, did that contain articles on gas and analyses of gas?-- Sorry, sir, there were a lot of papers in that. I never professed - I will not profess to have read every single one of those papers, but there were many different types of papers and I can't - I wouldn't be able to say exactly if they were gas related or spontaneous combustion related - in the AUSIMM magazines.

Before August 1994 had you done some further training in relation to a position in the mining industry?-- The extra training - the only extra training I did do was the two week preliminary training to become a Mines Rescue member, and maintained that right up until the explosion.

Were you not undertaking studies in connection with getting your second class mine manager's certificate?-- Yes, yes, I conducted them on my - at my own steam, yes.

So, what you said just a moment before that is not correct?-- I have still not obtained my second class ticket as such.

The question I asked you is whether you undertook any studies?-- There were no formalised studies, no. They were studies on my own bat with my own experience.

With a view to obtaining a second class mine manager's certificate?-- In the hope to, yes.

When did you commence that?-- The actual studies or the - the studies would have been an ongoing thing while I was at Moura. Albert gave me a little bit of time off between 30 May and 6 June.

1994?-- 1994. On 6 June 1994, a Monday, I sat for my written second class underground ticket.

Yes, you did, and you passed?-- Yes, I did.

And before that you had a curriculum of the course?-- No, I did not, no. The written exam predominantly was to be able to learn the Coal Mining Act back to front and inside out and understand it, so there were only really two books and a substantial number of past exam papers to identify what sort of questions I would be - that I would be getting.

What books were they?-- The Coal Mining Act.

You said two books?-- There is a General Rules for Mines, coal mining. The second class ticket in Queensland enables you to sit for an open-cut and an underground second class certificate of competency. You have to have experience in both. I had only one year at the open-cut and then the remainder of my experience was at the underground and I was trying for both.

In your study for that exam you say you studied the Queensland Coal Mining Act or Coal Mine Act of 1925 as amended?-- That is correct, yes.

And as well the General and Special Rules Relating to Underground Coal Mines?-- Specifically for open-cuts, that's right.

Open-cuts only?-- Yes, the book was a making of rules for open-cut.

But attached and emerging out of the Coal Mining Act of 1925 as amended there are several sets of rules, aren't there, not only relating to open-cut, but special rules relating to underground mines and general rules relating to underground mines?-- That is correct, yes.

And you studied those?-- If I wanted to pass the exam, yes.

But you did study them?-- I did study them, yes.

Now, within the Act and the Rules you studied there was a lot of space or sections given over to gas and ventilation?-- That is correct.

So, when you were giving evidence yesterday or the day before or perhaps even today, it wasn't correct to say that you were ignorant of mine gases, underground mine gases?-- No, I'm not totally ignorant of mine gases, no.

You are certainly not now, but even by 7 August 1994 you weren't?-- No, my Mines Rescue training would also have assisted me in mine gases in 1992.

Did you get material from TAFE for the purposes of that course and that examination?-- No, I did not.

Have you achieved in New South Wales any statutory position?-- No, I have not.

Do you know of a contractor called Abignano, A-B-I-G-N-A-N-O, or J Gardner Contractors?-- No, I'm sorry, I am not aware of them.

Did you ever work on the Blackall tunnel around Maroochydore?-- No, no, sorry, I didn't. I worked on the Bondi sewerage tunnel but not -----

You know where Maroochydore is?-- Yes, I do, lovely place.

I am not talking about Bondi. By the time you finished your initial course, loosely called, at Mines Rescue in 1992, you knew, didn't you, from what you had learned, that 10 lpm carbon monoxide make was falling into the area of concern?-- Yes, that was what was in the Mackenzie-Wood book.

You also knew from that education that 20 lpm was potentially dangerous?-- That is correct, yes.

I just might deal with Exhibit 127 for a moment which is the Moura No 2 log alarm - alarm log, I should say. If you just look at that, if you wouldn't mind. I want you to ignore - well, I will just take you to it briefly. It speaks for itself, doesn't it? It is the location of a monitor point, time of alarm, time acknowledged, alarm description and so forth, reading across the top?-- That is correct, yes.

And others as well. Now, the new computer was installed, as I understand, on 27 July, so those first six entries relate to the day of installation. They are all on 27 July?-- 27 July, yes.

Coming to the next four items, they relate to the 2nd, 3rd, 5th and 6th, don't they, of August?-- That is correct, yes.

Now, you weren't there on the 6th, as I understand your evidence, but you were there on the 2nd, 3rd and 5th?-- That is correct, yes.

And on at least one of those days you weren't underground at all?-- That is correct, yes.

Well, can you - the 2nd did you go underground, just remind me, on 2 August? That's a Tuesday, I think?-- Tuesday. The 1st I did and the 4th.

I think the 4th you did?-- That's correct.

So, you were there aboveground on the 2nd, 3rd and 5th?-- That is correct, yes.

Now, I take it that you didn't hear alarms from the Unor system running for something in the vicinity of approximately three hours on the Monday?-- No, I can't recall.

I am sorry, on the Tuesday, I should say, that's the 2nd?-- No, sorry, I can't recall that.

Your office was really quite close to the alarm siren?-- I would have heard it.

You certainly would have heard it?-- I would have heard something, yes.

And similarly on the 3rd - that's at night-time, you may not have been on shift at all - sorry, that's not night-time, it's during the middle of the day. Were you on shift then?-- Day shift, yes.

You heard no continuous alarm - siren, I should say?-- Not that I can recall.

Well, you would recall it, wouldn't you?-- Not that I can recall, no.

Well, you would recall, wouldn't you, if there was continuous interference with your thought processes?-- For how long?

For however long you were on shift after 11.09 on 3 August, about four hours probably?-- No, I cannot recall.

But you would recall if you had an uninterrupted siren interfering with what you were doing. It is intolerable, isn't it?-- Yes, the siren is intolerable, yes.

It is meant to be. Similarly, on the 5th there is an alarm for something like an hour or so, or less than an hour, some 16 minutes. You don't recall that?-- No, I do not recall that.

Now, were you familiar at all with the Unor alarm system, whether it be by way of alarm on the Unor or siren attached to the Unor?-- In my time at the No 2 underground I had never accepted any alarms.

I am not suggesting you did?-- No, but - and, therefore, I didn't - I would have heard the alarm, as I did on the day of the second explosion. It is very piercing, but I hadn't accepted any at all.

See, what I am suggesting to you is that in the system which existed, you being part of management, that if the siren were operative, that is, the siren operative and alarming with an alarm on the Unor, you must have heard it?-- Yeah, I would have, you couldn't miss it, but -----

Doesn't that suggest to you that the alarm wasn't set or reset - siren, that is, set or reset if it was receiving an alarm on the Unor?-- If it was receiving an alarm on the Unor -----

Well, it was-----?-- I can't remember.

The document says it was - seeing the document, it is true?-- Sorry, I'm not much help to you.

What, to you, as an ordinary, every day member of the community does a siren mean? Danger?-- Yes. Not just danger, but something to be - it is a forewarning.

To do something?-- To do something. There were a number of alarms. We had installed - yeah.

Okay. You know, don't you, just from your every day contact with the average mine and average deputy, that they're good fellows, a bit rough and ready and not a lot of education?-- No, sorry, I don't hold that point of view. A lot of the fellows are educated in a lot of other aspects, other than technical aspects, but-----

Okay?-- There were a lot of good craftsmen and good tradesmen that were miners.

Occupying a mining position from another trade, that's what you are saying? They previously did something else?-- That's correct, yes.

For a man who didn't have, say, as much information or education in relation to, say, mine gases or spontaneous combustion and things of that description as management at Moura was supposed to have, the siren, I suggest to you, would at least put them on notice to inquire as to what was going on?-- That's what its intention would have been, yes.

To make people who may otherwise have been ignorant get into a state of alarm and start asking about their well being; that must fellow?-- Whether you be ignorant or educated, it is a good warning.

I understood you to tell my learned friends to my right that a lot of the position descriptions were written by you?-- That is correct, yes - or put together by me, yes.

How does one "put together" a position description? Did you just sit there in your office and say, "Well, what should this job entail?"?-- No.

All right. Tell us, please?-- Part of the BHP system - there is a performance - an annual performance review that outlines individuals' responsibilities in conducting - one of the tasks in putting the position descriptions together, I would grab the respective person, ask them if they would bring that personal information-----

To you?-- Not just to me, and we would sit down and we drafted it together. I never sat and thought up all those lovely things. It was on a consultative basis.

You would have been still writing many of them even now if you put that amount of time into it. It would have taken a

massive amount of time?-- The QA system - to introduce a QA - so it doesn't fool anybody, to introduce a QA system does take a considerable period of time and there is considerable effort on behalf of a lot of people.

When you came to Moura No 2, or at any time thereafter before 7 August 1994, it is the case, isn't it, that nobody in management thought - I withdraw the "thought" - gave you any instruction on the importance of the Unor or how it worked?-- That is correct. I was not shown how to use the Unor, other than by Allan Morieson.

Now, we know in this Court that there existed at BHP No 2 Mine a manual or a brochure on the Unor system. It was held up in Court a couple of days or a few days ago, if my memory serves me correctly?-- I remember that, yes.

Where is it? Is it capable of being produced to this Inquiry?-- At this Inquiry?

MR MORRISON: Absolutely. I can produce it right now. We will do it now.

MR MARTIN: Thank you.

Moura No 2 Computer Operator's Manual, Maihak Australia. Before it was held up in Court the other day, had you seen it?-- No, I had not.

Do you know whether - have you looked at it since it was held up in Court?-- No, I have not.

I tender that manual.

Do you know whether it relates to the computer that existed before 27 July, or after 27 July?-- I would assume it would be the touch screen. Like I said, I haven't looked at it, but I assume it would be the touch screen.

I haven't looked at it either. In the Unor room was there anywhere that that document - that manual could have been kept? It wasn't kept anywhere visible to you, at least, in the Unor room?-- Not that I was aware of, no.

And nowhere that you were aware of in the offices of any of Mr Schaus, Mason, undermanagers?-- Sorry, I am not aware-----

You weren't aware of-----?-- No, I wasn't aware, no.

Am I right in suggesting this to you, I think: that you received no instruction, except from Mr Morieson, about the Unor system?-- That is correct. You only needed to be shown-----

We can take it that nobody else at the mine did in inferior positions to you, such as deputy or miner, receive any course of instruction either - that you are aware of - on the Unor?-- I don't know if that's a correct statement to make, because-----

Well, do you know it is not a correct statement to make?-- It is not a correct statement to make.

Well, say so?-- Because there were deputies at No 2 underground that were able to use that screen.

And are you presuming then that they received some course of instruction that you didn't receive?-- You didn't need a classroom-trained instruction. It was fairly easy - on my behalf, anyway - to be able to utilise that screen - to get information out of that. It is an assumption on my behalf that there were other people-----

Who could use it?-- -----that could use it, specifically the deputies.

And you, of course, are a graduate engineer and know all about computers from university; that's the case, isn't it?-- No, I only started learning about computers when I joined BHP Australia Coal.

Didn't you have computer facilities at Wollongong University?-- There were computer facilities at Wollongong, but they operated on the main frame when I was there. PC's were a very new thing at that stage and I had very little exposure to that.

Coming back to my question of a few minutes ago, you cannot tell this Inquiry of any system of instruction that was laid down by management, of which you were part, for instruction on the Unor to rank and file deputies or miners?-- There was no official program as such.

No program, I suggest?-- No program.

Thank you. And similarly, I suggest, in relation to that old-fashion piece of equipment called the gas chromatograph, which was also in the Unor room. There was no system of instruction laid down by management for usage on the gas chromatograph, was there?-- There were individuals that-----

Please answer it. Please answer my question?-----

MR MORRISON: You should give him a chance.

MR MARTIN: He is not answering the question.

WITNESS: There were people specialised to be able to use that instrument and I was shown that instrument at some stage of the game, but if you do not use that instrument on a regular basis - and that would nearly be a daily basis - it is a far too sophisticated and temperamental machine to just jump on whenever you wanted to.

MR MARTIN: Let me now come back to my question of some minutes ago. There was no laid-down system by management - BHP - for usage of the chromatograph, was there?-- Can you define "usage", please?

You do speak English, don't you?-- I do speak English.

What does "usage" mean to you as an engineer?-- Are you looking for set procedures?

Yes?-- There were set - there was training on how to use the gas chromatograph.

Right, pause there. What training?-- Training that was conducted by Mr Robertson with his electricians and Mr Selff. That system, whether or not - the fact is it wasn't documented, but there was a system in place where he was training people to use the chromatograph - the very specialised piece of equipment.

What training? What was the course? What did he train? You are management?-- He showed them how to use and calibrate the system and send spans on a daily basis to the SIMTARS group.

All right. No system written or otherwise as to whether mine atmosphere from a particular panel should be tested on the gas chromatograph?-- That is correct.

And all we have heard in this Inquiry so far, apart from Mr McCamley on back shifts occasionally using it for that purpose - all we have heard so far is that it was tested and kept in operational order so that it could be used?-- That is my understanding at this point in time, yes.

Just coming back to the Unor for a moment: it had a facility for analysis for hydrogen. If you personally don't know, say so?-- No, I'm not aware of that, no.

You weren't any stranger to the Unor before August 1994, were you. You frequently saw it, you frequently used it?-- I frequently saw it. I used it on occasions.

All right. So, when you saw it and occasionally used it, you saw on the panel running across the top the words "Graham's Ratio"?-- As the last column, yes.

Did that not prompt you at any time during your period at Moura before August 1994 to inquire about Graham's Ratio?-- In hindsight it should have, but I didn't at the time, no.

Before August 1994 had you ever heard of the ratio between carbon monoxide and carbon dioxide?-- No, I had not, no.

Have you heard of it since?-- At this Inquiry I have heard it raised a number of times.

Before this Inquiry and after the explosion?-- No, I had not - I had not looked into it then.

This is going off the subject for a little, but who at the mine in management - you're in a fairly senior position - you are a mine engineer - who at the mine, other than you, would have known such things as the relationship of hydrogen,

Graham's Ratio, CO, CO2 ratio? Who?-- I don't honestly know.

Do you think anybody did?-- I can't answer for anyone else at this point in time.

Of course you can't. But nonetheless, you and several others comprised management of that mine which blew up on 7 August 1994; that's the case, isn't it?-- That is the case.

Do you understand the gas chromatograph and indeed the Unor with its new computer system to be the latest state of the art scientific techniques for determining what's happening inside a panel in terms of its atmosphere?-- Yes, I assume that is what we were using.

Do you know whether the gas chromatograph was fitted with or equipped or had built into it the SIMTARS CAMGAS system?-- Yes, I was aware of that, yes.

Before the explosion?-- Before the explosion, that's correct, yes.

And what did you think or know about that system?-- Very briefly-----

What was it's purpose?-- Very briefly, Col - in '92 when Col was installing that system, he just explained to me that that would give us the ability to send the information from the mine site to Brisbane.

But, in any case, had the gas chromatograph been used before the explosion in the days leading up to or indeed even the weeks leading up to the explosion, it had the capacity, if there was somebody trained at the mine, to interpret what it did - to tell the mine - the mine management a variety of things, including whether there was a heating?-- It possibly could if it identified the hydrogen and hydrocarbons, for sure.

All right. But it did have that capacity to identify hydrocarbons?-- That's what - its main function was to be able to identify that - the hydrogen and hydrocarbons.

And it could have told a trained person, if used, or would have told if used, whether or not there was a heating and, if there was a heating, how hot it was?-- Whether there would be a possible heating, if those products were identified, I'm not sure if - to be able to specifically say how hot it was.

All right?-- I'm not qualified to answer that.

No? You're not, you say. And you know the SIMTARS system, if there was any doubt about what the gas chromatograph was reading, or indeed if there was any doubt about what the Unor was producing, there was a 24 hour a day scientist at SIMTARS who could have given all of the assistance that was necessary over the telephone virtually instantly?-- I understand that to be the system, yes.

Was there, to your knowledge, any type of manual or brochure on the gas chromatograph before 7 August - at Moura No 2?-- Not that I can recall.

You have personally never seen one?-- I have not seen one, no.

Well, since 7 August 1994, are you aware of a manual or brochure at Moura No 2 on the gas chromatograph?-- Of the gas chromatograph system?

Yes?-- Yes.

Where is it?-- Where is it?

Yes?-- I think there's a set of green folders next to the gentleman behind you on a course that they run.

But that was at Moura No 2?-- No, that - you said post explosion, I've seen that here.

Have you seen it post explosion at Moura No 2?-- Not post explosion at Moura No 2, no.

You knew before 7 August 1994 that the Drager had a known error factor?-- I did not know the factor, no.

But you knew it had a known error factor, I'm not asking about the percentage?-- It had - it had possible limitations as - from Mines Rescue you were able to - you would identify limitations of different pieces of equipment.

Can you agree with me or not that you knew that it had a known error factor?-- No, I cannot agree with you on that.

Well, you knew from Mines Rescue that it had limitations?-- That is correct.

What do you say they were?-- The use of the 21/31 as a piece of equipment and the method of sampling and the integrity of the sample tube that you were using with the 21/31.

Coupled with the subjective element of one's judgment of what he saw and perhaps your trouble with red/green colour blindness?-- Correct.

And I sympathise with that because I have it myself. All those things play a part?-- That is correct, yes.

Of course there was a delay factor on the Unor between sampling and analysis, wasn't there?-- That is correct, yes.

Did you know that by 7 August?-- Pre-7 August, yes, I was aware that Mr Schaus and Mr Evans were talking about and looking at options of telemetric monitoring systems.

That's one of the systems referred to in Mr Mackenzie-Wood's book, isn't it, Strang and Mackenzie-Wood?-- It's another system for continuous monitoring, that's correct.

How long has that been around?-- I couldn't honestly give a date, sorry.

Pre-1985, I suggest, that's the first edition of Mr Mackenzie-Wood's book. I think it's referred to there. It's been around for a long time?-- The system has been in place for a while, as long as I can remember.

Do you agree with this proposition: it is fairly useless in comparing a Unor reading with the Drager reading unless the two measurements precisely coincide in time because of the velocity taken by the deputy?-- Sorry, to determine - could you repeat that question, please?

Yes. I'm just asking do you agree or disagree with the proposition that it's a fairly useless exercise comparing a Drager reading with a Unor reading of parts per million carbon

monoxide unless the deputy took the velocities at the same time as the underground monitor for the Unor took its sample, from Drager to the surface, they would have to coincide?-- They should coincide, yes, but -----

Because otherwise the velocity -----?-- It's not useless, sorry.

I said fairly useless?-- It's not even fairly useless, it's more than useful.

It's fairly non-helpful. Do you agree with that?-- You can at least have the ability to check off at 13 minute intervals when you did readings.

Had you ever heard of a Mr Cliff who is a scientist and who appears in Appendix 5 or an article by him appears in Appendix 5 to the SIMTARS reports in this case?-- I know of Mr Cliff since coming to the Inquiry. I hadn't met him at Moura until the Inquiry.

Before August of 1994 had you ever read any of his papers or literature?-- I can't recall if I specifically read Mr Cliff's reports.

Did you ever see any articles or papers or literature by Mr Cliff - perhaps it's Dr Cliff - around the Moura Mine offices of management?-- I'm aware of SIMTARS magazines that used to come to the offices, yes, but I can't specifically recall papers written by Mr Cliff.

Do you know of a paper by him relating to early detection and monitoring of fires and heatings in underground coal mines?-- No, I'm not aware of that.

Before the explosion?-- No, I'm not aware of that.

Are you aware it existed before the explosion and has that come to your knowledge since?-- No, actually it hasn't. I haven't seen the paper.

Do you know if a Dr Chamberlain, an English scientist who has produced as far back as 1973 or 1975 a paper or papers in relation to detection of spontaneous combustion?-- Post the explosion I have seen the blue book and the red book that contain his graph, yes.

Just look at these and say whether post explosion or before explosion you had seen that type of literature. Please don't mix it up with any other material. You need not look at every page, I'm more interested in the heading?-- Are there only two documents?

I can see there are lots of attachments, but the front one is a later synopsis and the other one is a paper, I think?-- No, I'm afraid I haven't seen them at all. That's the first time I have seen them.

But its title is - just read it out for the Inquiry?-- "The

ambient temperature oxidation of coal in relation to the early detection of spontaneous heatings - Part 2."

I suppose you can't comment on the ability of that document to help you if you've never red it, so pass it back, if you would. You talked about a red and blue book; which ones had you seen before August 1994?-- I had seen none of them.

Does that mean you hadn't read any of them, either of them?-- Hadn't seen any of them.

Nowhere in any of the offices of management at the mine had you seen them?-- I had not seen any of them, no.

But you yourself collected a bundle of material, I think you told numerous of my friends, some of which related to various aspects of mining. What did you collect that related to spontaneous combustion or carbon monoxide?-- I collected a book, the blue book -----

Sorry, could you just describe that, just pausing there?-- I forget the name of the title now as such, but it's an exhibit in the courtroom.

Is that "Mining and ventilation practices in coal mines liable to spontaneous combustion."?-- I think that's correct, yes. It's a blue-ish cover.

Did you ever read it?-- No, I did not.

Why would you collect it?-- To one day in the hope of reading it, I suppose, but I did not read it at that stage.

You got the glossy covered Strang Mackenzie-Wood book?-- That was given to me by Dave Kerr, that's correct, yes.

In 1992, perhaps seven years old by then, but nonetheless did you read that?-- Yes, I did, I read respective parts. I hadn't read cover to cover.

Well, did you not read parts relating to Coward's Triangle, Graham's Ratio, CO/CO2 relationship?-- I had read that section briefly, yes, the Coward's Triangle, the Ellicott's Diagram, yes.

Did you not read those sections relating to Graham's Ratio?-- I had read them, but I did not at the time put any significance to those particular numbers.

Why not? You were only in a spontaneous combustion seam, weren't you?-- A seam liable to spontaneous combustion, that's correct.

And with a known high gassy component?-- Yes, I had read a lot of literature on gas drainage and pillar design. Gas analysis was not something that I had spent very much time on.

Why not? You're management you have told us?-- There are only 12 hours in the day.

There is 24?-- You've got to sleep sometimes.

Lawyers get 24 hours?-- You could only spend 12 hours a day at work.

You agree that spontaneous combustion at Moura with a known gassy coal seam had the capacity to produce an enormous disaster?-- That is correct.

Yet you didn't read, as management, the fundamental materials about it, or if you did you passed over them?-- I had read it, but I didn't take much note of them.

Well, what do you say about that now?-- Obviously that's one part that you would have liked to have learned a lot more about in a lot more detail.

Not like, it was your first duty, wasn't it? The most dangerous thing basically which could happen within a mine atmosphere?-- That is incorrect.

What is more dangerous than blowing up a mine and killing 11 men?-- The high concentration of methane in the seam.

Without the heating or the ignition source there is no explosion, is there?-- Without the fuel you do not have an explosion. They work hand in hand.

Yes, of course they do?-- At the time that I had spent at Moura I had well and truly thrown myself into the gas drainage because at that time that was a priority to mine coal.

Always has been a priority. Are you saying it's priority to safety?-- No, to enable safe mining of coal you wouldn't be able to mine any coal if we didn't gas drain the Moura D seam.

I understand that. Well, you've told us about your ignorance in the respect at least of spontaneous combustion. Who else in management was charged with the duty of having that knowledge?-- I can't honestly answer that question.

Somebody must have had the responsibility. The buck must stop somewhere. Where does it stop? Does it stop with you or does it stop above you, and if so where?-- I don't know. I cannot answer that question. That's not a -----

In relation to literature generally which you've seen and produced to this Inquiry, you've mentioned red and blue and you didn't see those, but what about other books such as the three volumes of SIMTARS training for mine officials? Had you ever seen those firstly yourself?-- No, I had not.

Had you ever seen those in any other office within Moura whether it be No 2 office or No 4 office?-- No, I was not aware of it, no.

You are aware of Section 61 of the Coal Mining Act, aren't you, that is in the case of danger men are to be withdrawn?--

That is correct, yes.

And you know that all of the reliable literature says that after a sealing the men should be withdrawn or evacuated?-- Sorry, I am not aware of that, no.

Good mining practice in terms of preserving the safety of men would require that, I suggest?-- In hindsight with the information that we know for 512, yes, but the other panels that we had -----

Didn't blow up?-- No, there was no - we sealed it and continued to work.

I heard you say in evidence in response to one of my friends that you read the findings of No 4 explosion?-- That is correct, yes.

Now, you knew that that wasn't a spontaneous combustion or probably wasn't a spontaneous combustion, didn't you?-- Yes.

Yet you knew that Kianga and Box Flat were spontaneous combustions?-- I understood that Kianga was. I did not know about Box Flat.

What do you mean you didn't know? Did you not ever hear of the Box Flat explosion?-- No, I did not hear - I knew of the incident, but I did not know of the circumstances that prevailed in that mine.

Why wouldn't you read the findings of Kianga or inquire into Box Flat or indeed some of the spontaneous combustions elsewhere, explosions that is, elsewhere in Australia?-- Because at that stage spontaneous combustion was not a major issue that was being addressed. The major issue that I was addressing at that stage was the degasification of the D seam.

I am going to be a little while yet, more than a little while.

WARDEN: Thank you. We will take the lunch adjournment.

THE COURT ADJOURNED AT 12.58 P.M. UNTIL 2 P.M.

THE COURT RESUMED AT 2.10 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MARTIN: Mr Abrahamse, you were on day shift on Friday, 5 August?-- That is correct, yes.

And you finished about 3.30 or so?-- Normally about 4 o'clock, 3.30, 4 o'clock.

What was the system of staffing at Moura No 2 on weekends? Was it virtually a skeleton staff of management or no management?-- There was an undermanager that would be on shift on the Saturday day shift with a - with the electrical foreman or electrical engineer and the mechanical engineer or mechanical foreman there.

But periods of hours without an undermanager present?-- They were only there on day shift.

Not afternoon and not night?-- That is correct.

Can I just take you back to some questions that Mr Clair asked you about Martin Adams and Glen Everett and another gentleman who is Malcolm, I think it was. Having thought about it since, have you recalled anything of that visit about a deputy and a make of somewhere between 16 and 17 lpm?-- No, I'm sorry, I can't.

And did you do any plotting of a CO make after they left the mine on that day?-- No, not on this particular - not that afternoon. I did one in the morning.

Before they came?-- For the previous Friday. They only arrived some time after - I think after 9 o'clock.

You were in Court, I am sure, when Mr Morrison representing BHP and you and others went through a system of computer records relating to training or retraining of men; do you recall that? Some computer records as to courses they might have attended or safety meetings they might have attended?-- There is a safety chart, yes, with training -----

Does any such similar document exist in relation to people such as yourself, Mr Mason, Mr Schaus, Mr Barraclough or management generally, a similar document anywhere?-- There is a document that would record when we went to shift meetings or when we did refresher training, but as regards machinery, the only thing we would have is a PJB tick against the name.

With the benefit of hindsight which we have heard about, what different steps would you, indeed management - should, not would - should have undertaken in relation to panel 512? What do you say now that it should have done?-- Sorry, with regards to?

512 Panel, and in particular from 11 June onwards, what

different things, if any, do you say now it should have done?-- Well, obviously the CO make should have been watched a lot more rigorously and then accordingly plotted, and that being our system to identify any problems in the panel itself with regards to spontaneous combustion.

All right. Emerging out of that, what do you say about the usage of the Unor? I am sorry, I meant to say gas chromatograph?-- The gas chromatograph?

Yes?-- If we conduct - as a recommendation that comes out of - has come out of this, that maybe when carrying out a full investigation of a possible heating maybe it would be an advantage to take bag samples at respective spots in the goaf and also to be able to map out some type of plan of operation underground that you conducted underground.

You spoke about bag samples before, I think, to probably Mr MacSporran, perhaps Mr Clair. At Mines Rescue Mr Kerr or somebody else showed you about bag samples and how to take them?-- As part of our Mines Rescue training, yes.

For what purpose did you think you were taking bag samples or learning to do it?-- Well, obviously if you take a bag sample after an incident, you would expect the - well, at that time the tube bundle system to be inoperative, you couldn't really use a tube bundle to evaluate properly where you were getting samples from, so if you had the ability to re-enter the mine you would take bag samples at respective spots in the mine and have that analysed.

All I am suggesting to you is that bag samples of mine atmosphere could have been taken at any time in and around the goaf before sealing and analysed either on the Unor or the gas chromatograph at the surface?-- If after an incident, yes.

What do you call an incident? Are we talking about the same thing? Are we talking about, say, a re-circulation problem or short-circuiting or a layering of methane?-- You have to look at what context the -----

Just answer the question. Is that what you call an incident?-- An incident is after an investigation or investigating an area.

Just so we are on the same wave length, an incident is something that requires investigation. Are we talking about the same thing?-- We can clarify it as that, yes.

So, if one had an incident in 512 Panel, a bag sample in the area of the incident could have been taken there and then; right?-- It could have, yes.

Then taken to the surface and either put onto the Unor at the surface or the gas chromatograph?-- Well, if you are going to go to the trouble of getting a bag sample, you just as well put it on the chromatograph.

Did Mr Kerr at any time when you were in his company on

22 July suggest to you that more frequent readings should be taken?-- No, he did not indicate that to me.

Before 7 August 1994 were you aware of what was done in other mines in relation to usage of gas chromatographs?-- No, I was not aware.

Do you know that there is and was in August 1994 an Australian standard on the gas monitoring systems, in particular in relation to the calibration?-- Beg your pardon, could you repeat that question, please?

Yes. Did you know by August 1994 that there was an Australian standard in relation to the gas monitoring systems relating particularly to calibration?-- No, I was not aware of it.

Well, you are aware of it now?-- Listening to the Inquiry, yes.

Do you know whether the standard existed at Moura No 2 before August 1994?-- Sorry, I could not comment on that.

We have heard a bit about the cap lamp number supposedly being entered into the Unor when it was accepted or acknowledged; do you recall that evidence?-- I do recall that, yes.

Was there any such system according to you?-- I was not aware of such a system, no. I had personally not accepted any alarm and, therefore, I wasn't aware of it.

Well, the occasion might have arisen where you had to?-- The occasion didn't arise, no.

But the occasion might have arisen, mightn't it, where you had to deal with something occurring on the Unor screen?-- If I didn't know, I would have asked at least one of the deputies.

But nobody ever told you that there was a system of entering the cap lamp number when acknowledging an alarm on the Unor?-- No, no, I didn't know.

Are you familiar with the Minerisk analysis document which came into existence about possibly late in May 1994 in relation to 512?-- I was aware that a risk analysis was being conducted in that panel as a suggestion from Bernard Madden to Albert Schaus, but I had not seen the document at all, no.

By the time of the explosion had you seen the document?-- No, I had not.

Can you help this Inquiry - you were talking before earlier today about the Tecrete prep seal and Tecrete product. Can you say whether the usage of that as a final seal was ever approved by the Department of Mineral Resources?-- The approval documents for the material and the pumps - there was an approval for that, yes.

Well, the approval you are speaking about was as old as 1983

from the Department to Tecrete direct; that's right, isn't it?-- I can't comment on the date, sorry. I would have to see the document again.

Well, if we come back to my question: can you inform this Inquiry as to whether the Department of Mineral Resources had ever approved Tecrete as a final seal of a panel?-- Yes, I was aware that there was an approval letter to say that that was - that could be used, yes.

Well -----?-- That material could be used.

Well, where is the letter?-- I remember in some of the information the Inspectorate required they asked for the approvals from Tecrete. That would be one of the documents that the inspectors would have. Sorry, I wouldn't be able to tell you what number it is.

Have you ever seen that document?-- I collected that document. I obtained that from SIMTARS - from Tecrete and put that together with the other information requested. We were given approval from Tecrete that that system was in place in - or was approved by the Mines Department.

As a final seal. I don't want you to be under any misapprehension as to what I am talking about?-- Yes, the mesh block itself would have been developed for a final seal, that is correct.

I am suggesting to you that it was only ever approved as a stopping?-- We would have to determine that from the mesh block approval that the Department agreed to.

Well, you say that there exists, within the Inspectorate documents taken from BHP No 2, such an approval?-- There is an approval of the material used, yes.

Did you ever read it?-- Yes, I would have read it.

No, not would have, did you?-- I collected the information, I would have read it.

Well, what did it say?-- I cannot remember, to tell you the honest truth.

Why - just tell me this before I ask you the question: do you know how the Unor system arrives at this weekly average of the CO readings?-- I have never interrogated the actual workings of the system. All I had looked to do was get the respective dates that I wanted to look at. Obviously there would be an averaging system over whatever dates you requested.

Well, it's a computer. There would be thousands of calculations involved, wouldn't there, and they could be done within a second or so?-- They are done within a very short period of time, yes.

But you know, don't you, that a weekly average is going to even out any high spot?-- That is correct, yes.

Can you give this Inquiry any help whatsoever - and I am not attributing any default to you - as to why the - can I call it the daily log commenced on the 23rd wasn't continued after about the 25th or perhaps 26th?-- No, I can't comment other than the fact that someone would have made the decision that it didn't need to be done. The scare over the weekend on the 22nd had been assessed, analysed, investigated and put to rest.

Well, that's an assumption on your part?-- That's correct, because I was away for that week.

An equal assumption is that it was just forgotten about?-- Well, it was forgotten about on my behalf because -----

I am not suggesting -----?-- Because I had been told that the readings were - the parts per million were the same as the week before and that was confirmed by the dates that I had plotted up to the 29th.

Can you just help the Inquiry with this: the Quality Assurance person for ventilation was Mr Morieson?-- That is correct, in his written - in his position description, that is correct.

And of the choice between Bryon and Morieson, the obvious person to do the ventilation task is Morieson?-- Preferably if he was there, yes.

Well, I just want you to tell us why it was when he was called in on Friday the 5th to work that he wasn't put onto his usual duty of ventilation officer and Bryon put on deputy's duty?-- I had realised that Albert - that Allan Morieson was back from holiday on the Wednesday. I also knew that George was looking for deputies on the Friday afternoon shift, he was short a few deputies, and I suggested to Mr Mason that he contact Allan Morieson who had returned home, and he wasn't supposed to come to work until the Monday, and I said to George that I'm sure he would be willing to come back for one day - you know, come back on the Friday and pick up a bit of extra money.

Well, I understand that, but I can't understand - I withdraw that. Why wasn't Mr Morieson put back on the Friday on his usual and proper duty as ventilation officer and Bryon put back on his usual duty as deputy?-- I can't answer that honestly because I wouldn't know. The deputy shortage was on afternoon shift and that's the time that Allan Morieson came in, on Friday afternoon shift. Whether he suggested to George that he was still jet lagged, you know, from coming from overseas, I don't know.

Can I just ask you, please, to look at Exhibit 105? I don't know whether there is two documents pinned together there or not?-- Only one.

Well, the other exhibit is 91. They respectively are ventilation surveys of No 2: 27 June 1994 and 12 July 1994?-- That is correct, yes.

Now, I suggest to you there is a very significant increase in the parts per million - sorry, litres per minute of carbon monoxide on 27 June. You see 9.71?-- That is correct.

And when you go to the other one, 105 - sorry, 91, it rises to 15.07?-- In July, yes.

Yes. Now, that's a most significant increase, isn't it?-- It is an increase, yes.

Where, looking at those two documents, do you see any abnormality in any other readings of CO make anywhere underground?-- Of CO make?

Yes?-- At the bottom of the fans.

Where is that? What is that reading?-- In June you have got 10 litres at the shaft - southern return, and in July you have approximately 31.27.

What do you say is the explanation for those two increases?-- Sorry, I cannot answer - I don't know.

Well, I am not suggesting-----?-- Just one moment, please. One thing that is quite different to give those results is the quantity of air running through the panel at that stage.

Sorry, at which stage?-- The difference between the June and the July figures. In the June figure you have 5 parts - in June you have 5 parts at 32 cubic metres per second, but in the July, you have 6 parts; an increase of 1 ppm of carbon monoxide and an increase of roughly 10 cubic metres per second through the top return. That would be the indication that you would get a larger quantity.

What I'm asking, so far as 512 top return is concerned on the respective dates, there is a most significant increase, isn't there, in the CO make?-- There is an increase of 5.3, yes, over four weeks - 5.3 over four weeks.

And do you say or not that it would be good practice to investigate how that came about, or whether there was a reason for it?-- Yes, I cannot comment on the reason for that particular-----

No, but good practice to go and look at that?-- That is correct, yes.

You know - it is the case that you know, isn't it, that Mr Schaus found 19 lpm on 5 August 1994 in 512. You say you don't know that?-- I do not know that, no.

I suggest to you it was written up in the Mine Managers' Book for 5 August - record book - Mine Record Book?-- I'm sorry, no, I've not read the Mine Record Book. I'm unaware of that.

Did you know that the sealing was imminent when you left on 5 August?-- Yes, it was planned for the following week, either the Monday or the Tuesday.

Yes. Can you give any account as to why it was brought forward to the Saturday?-- I was not aware that it was brought forward to the Saturday at all, no, over the weekend, no.

When did you learn that? Obviously Sunday night or-----?-- That is correct.

Or very early Monday morning?-- I didn't actually learn about it on Sunday night. I found out earlier on in the morning.

All right. Were you available in Moura over that weekend?-- On the Saturday afternoon I had - at 2 o'clock I left Moura to go to Rockhampton to pick up my sister-in-law. I arrived home 7 o'clock that evening - that Saturday evening, and then on Sunday I was disposed all day at a church function.

But nobody in management told you that the sealing took place on the Saturday afternoon, very early Sunday morning?-- No I was not aware of that.

Nobody told you that, "Look, we really might need your opinion about what's happening here."?-- No, I was not asked.

I will just show you one document - Exhibit 149, I'm reminded. Just tell the Inquiry whether a graph, which you are about to look at, would have been any help, at least to you, in forewarning you as to what was going on in 512?-- You see, there is a fair bit of information on this just to be grasping in two minutes.

Yes, well, on the left and on the right you have the parts per million, right?-- That is correct.

Across the bottom you have the velocity?-- That is correct.

And in the centre of the page, you have a 10 lpm curve, 20 lpm curve, 30 lpm curve, which somebody has plotted and calculated?-- That is correct, yes.

Now, at any time before 7 August 1994, with your very little or lack of knowledge about spontaneous combustion and CO makes, would that have been of assistance to you, because it tells you on the Code at the bottom what you should do?-- It gives instructions to persons doing the reading, yes. The graph is just - I will need a little bit of time to digest everything that's been placed on that graph, but the instructions down the bottom are directives.

Well, if that's accurate, do you agree that that would have been of assistance to you before 7 August 1994 with the state of your knowledge?-- That's absolute comments down the bottom - that would have had to have been drawn up by somebody - sorry, there is a fair bit in that to digest, and there is a possibility that that could have been - someone has obviously gone into a lot of thought and detail to construct that. It would be an interesting point of discussion in the industry, I think, to have that analysed and find out where it has been.

That's the first time I've seen it.

I can tell you it is in use in a mine in New South Wales. But do you think that a document like that put up in a prominent place or places around the mine would help a person, without a great deal of knowledge about spontaneous combustion or CO make, to determine what he ought to do?-- Yes, I'm sure it would. I have no doubt about that.

If it existed before August 1994?-- No doubt. As a matter of interest, the 10 and 20 litres doesn't really indicate an area of - or the grey area that I call it of where the zone is. That is - it is an interesting issue, but it doesn't seem to be very clear to my mind other than the note down the bottom.

Let's just read it out. I'll read it out. "Any readings" - you read it out?-- I won't read it out. I think it is quite clear down the bottom what the instructions are. I'm just saying looking at the graph between the 10 and 20 lpm - I'm not saying it would be of assistance to people, but it is just interesting to see where the extreme danger of labelling lies in this particular graph - well above the 30 lpm curve. There was no indication-----

I suggest to you that it's not-----?-- No, no, I'm just saying looking at this at a quick glance.

Well, let's start again. From the extreme right - sorry, from the extreme left, with the litres per minute - or air quantity, I should say - across the bottom - so that if you go towards the right you have got, what, 42 cubic metres per second; you're in the extreme danger zone, are you not, at about 10 ppm?-- At 42.

About that?-- It looks between 10 and 15 ppm.

Extreme danger?-- At 10 to 15 ppm you are in that area, yes.

All right?-- I'm not saying that it would not be of assistance, I'm just asking the question, that's all.

Perhaps I might be-----?-- It would be interesting to see what the SIMTARS and everyone else thinks of it.

Do you recall a document which came about from a Quality Assurance program relating to emergency proceedings? It is an exhibit. I don't want to show it to you as-----?-- I am aware of it, yes.

But there is nothing contained within that document relating to emergency procedures, I suggest to you, about spontaneous combustion. You might need to look at the document to refresh your memory?-- No, I do remember the document. It doesn't specifically pertain to spontaneous combustion. It is - it was an emergency procedure for the evacuation of all employees from underground workings in the event of an emergency.

I suggest to you that there was - neither was there any contingency plan in the case that a panel, or 512, required

quick sealing, or quick sealing with a make of carbon monoxide which was considered-----?-- Sorry?

Was there any contingency plan?-- Yes, the establishment of your prep seals at the beginning of every panel is a system that's part of your Part 60 submission by the inspectorate to ensure that if anything does occur underground, that you have a rapid sealing process.

But it is one thing-----?-- And also at the operation there was Tecrete mesh that was on site that in the event of a major problem, that Tecrete mesh - not the mesh blocks - the mesh would be able to be erected rapidly and be constructed. That was an idea that was born from Mr Ziebell, or during an discussion between Mr Mason and Mr Ziebell to have on site that material.

Yes, all right. But as it turns out, the Tecrete seal was completed at about 1.10 a.m. with the explosion some 22 hours later, and I suggest that that was just an impossibly short time for any curing process to have occurred. You would have had no solidity at all within that period, or practically no solidity?-- It is surprising. You would have had some solidification of the homogeneous material, because the mesh blocks are of such a nature that it allows moisture to be released from the homogeneous or cementatious product. I can't give an exact figure, but it did cure - the one in 4 South level did cure fairly fast.

Yes, well, up to three weeks?-- As a - if you analysed it as a cementatious product, you would say that it had the properties of cement, or concrete, and therefore you would have different, varying curing periods. What the rates are, I can't exactly say, but the ultimate curing period obviously would have been three weeks.

In relation to spontaneous combustion or incubation period - or call it what you will - isn't the principal factor the fact that it can happen? It is known to occur and particularly known to occur in the Moura seams?-- It has occurred on one occasion.

Or more?-- And it could occur again.

That's the principal factor to look at, isn't it - that it can happen any time under a host of changing variables, none of which are consistent, one panel to another?-- That is correct. That is a possibility.

There is no question, is there, that the 512 seal was the final seal?-- The 512 meshblock seals were the final seal, that is correct.

Or were intended to be the final seal?-- That is correct.

But they did not, as we know, withstand an explosion?-- From post explosion and viewing the video, I don't think there were very many other seals that did either.

Let's talk about 512. It didn't withstand the explosion?-- No, the video shows that it did not withstand an explosion underground.

Just talking very briefly about the final monitoring point, I think you have said it would have been possible to have more than one point within the panel?-- Anything is possible. You just have to have enough lines, but, yes, it is more than possible to have more than one Unor point in the panel.

The desirable point, in so far as methane, at least, was concerned, would be in the highest part?-- That is correct, yes.

Which is towards - or it is outbye the final - well outbye - to the outbye of the No 1 return - as close as?-- Towards the seals rather than towards the inbye end of the panel, that's correct.

All right. But even so, one or two down No 1 return as well as that?-- That would be a preferable location.

And what is it, only a question of cost?-- Availability of tubes, I suppose.

One orders those from a supplier?-- Yes, you do.

Were you here the other day - I have forgotten the witness that spoke about it - I think it was Mr Edwards, perhaps, or Mr Robertson - only one shift to put up one extra tube to cope with one extra monitoring?-- That's correct, I remember that.

And as to tubing, I suggest that the cost of the extra tube would be only a few hundred dollars?-- Yes, it would be negligible.

For your examination which you did, I think in June 1994?-- My written examination that is correct.

And your study of the Mining Act and -----?-- That is correct.

You came on references to oxides of nitrogen, didn't you?-- That is correct, yes.

What did you imagine they were in the Act or the rules for?-- Specifically for diesel machinery.

And that's how one differentiates, isn't it, whether the haze is from diesel or from coal heating?-- You can use that, yes, to determine the -----

Because we know that oxides of nitrogen do not come from coal?-- That is correct.

But can come from diesel?-- Can come from diesels as well as - diesels obviously produce other gases as well.

In the very early stage of these proceedings there were tendered to the Inquiry some - or several videos relating to safety?-- To safety?

Yes?-- Yes.

More particularly I think one may have been called "Causes and prevention and fighting of fires and explosions", or broadly some title like that, and another was - was it "Fight that fire."?-- "Fight that fire", yes.

Did you ever see those yourself?-- As part of my induction.

But only then?-- Only then, yes.

Can you just help the Inquiry with this: you've spoken about International Mining Consultants and they gave a report in 1992?-- That is correct, yes.

One of their recommendations was that a computer model which was designed be used as a diagnostic and planning tool?-- That is correct, yes.

Can you tell us whether that was used in relation to the design of panel 512?-- No, I did not use that in relation to 512.

Can you say why?-- Yes, the principal reason that the International - Andrew Selff as such, in his report he gave to us was that we had to establish the 6 South overcasts. At the time of the pressure quantity survey we were losing about 50 per cent of the available fan pressure over the single overcasts in the 1 North West at about 24 cut-through and

therefore that was the bigger part of Moura No 2 Underground's ventilation problems. He was able to quantify - in his report he quantified the capital gain that we would receive by spending money on the overcasts further down dip which were finally located at 6 South. Until that work was actually completed and then a further pressure quantity survey conducted over the mine, and I had planned that - I was going to plan that for some students over Christmas - the model was therefore inaccurate. As they say, with models, any model, rubbish in/rubbish out and at that stage we needed to quantify again the extent of the benefits that the overcasts at 6 South gave to No 2 Underground and then evaluate that from there. On top of that Andrew Selff was asked to evaluate future workings for the next five years at Moura No 2 Underground with the assumption of installation of overcasts and other areas that we could - that we had the possibility to fix up, and using that information really limited me to just that one particular instance when he was there until we actually could modify the model to suit the current underground needs.

When you went to Moura No 2, I think you said in your evidence earlier that you were on a learning curve?-- I still am, yes.

I suppose we all still are, but you had nobody to teach you?-- That was one of my frustrating aspects of Moura No 2 Underground. The availability of consultants though over, the years that I was there, benefited me quite significantly in the methane drainage program and with regards pillar design and pillar criterior.

Left to your own devices as it were it would have been difficult to even identify a problem, I suggest, much less cope with it?-- That's suggestive, I don't know.

It's just common sense, isn't it?-- Suggestive.

Common sense, I suggest it's common sense. Did you write your own position description?-- Yes, I did.

I wish I could do that, I'd be sitting where Your Worship is?-- Obviously that was in consultation with the manager to see that I was - those were the duties that I had to perform, yes.

You gave yourself some onerous tasks, plenty of tasks. Can you just tell us briefly about the reporting clerk? He had a position description as well, didn't he?-- He did too, yes.

But as I recall the position description, and I can show it to you if you want to see it, there is really nothing about the description at all which relates to safety, but only to underground production or to production?-- Mr Eccles was a gentleman that looked after just specifically, like you said, the production and the maintenance downtimes. He assisted the mechanical engineer with the reporting of maintenance and then Mr Barraclough - or initially Mr Danvers who was a - safety training, and then Mr Barraclough, they looked after the safety statistic analysis that were then all combined at the end of every month to Mr Schaus.

Mr Eccles was on a statistical gathering process, wasn't he, with his underground reporting?-- With records production and maintenance and downtime, yes.

I'm just coming to that situation where there was no set-up or arrangement whereby there was reporting on a constant basis as a ship's log of significant incidents underground which could have been looked at with an overview by anybody?-- No, that is incorrect to make that statement.

Well, what is correct?-- In the deputies' cabin there was a book which allowed every miner, including undermanager and engineer, that if hurt in any circumstances underground could enter that into a log. That was viewed on a daily basis by Mr Barraclough.

"If hurt" did you say?-- If hurt. If I cut my finger, if I trod on a nail I could enter that into the book and then there were other more significant injuries, sprained backs, you know, twisted ankles et cetera that were reportable or - not reportable to the inspectorate, but were part of a reporting system at Moura that Mr Barraclough then collated using the undermanagers as mediums to fill out forms.

But relevantly to this Inquiry no system of reporting with an overview as to significant milestones or incidents relating to such a phenomenon as spontaneous combustion?-- No, personal injury there was not anything that really pertained to spontaneous combustion, no.

In the day-to-day work that you performed who did you have most to do with of, say, Mr Mason or Mr Schaus?-- The three of us worked together. I couldn't put a percentage on either Mr Mason or Mr Schaus.

Well, you could really if you thought about it, couldn't you?-- No, I couldn't.

You would know that you spent 50 per cent of your time with Mr Mason and the other 50 per cent with Mr Schaus or a 10th of the time with Mr Schaus and 90 per cent with Mr Mason. You would know that?-- I suppose more of my contact would be with Mr Schaus, but as I said, we worked very much together.

You said yesterday, I think it was, perhaps the day before, that a lot of the machinery was outdated and being upgraded or intended to be upgraded?-- Yes, I had very painstakingly evaluated how the machines had progressed over the last - a number of years to identify their productivity rate that they were working at and then made comparisons between other bord and pillar operations such as Laleham and then noting a machine's performance and being able to identify areas of that - timeframes where that machine either required overhauls or just needed to be replaced.

Did you turn your mind to the Drager which -----?-- To the - sorry?

The Drager monitoring or gas sampling device which was at the end of its life?-- The 21/31.

It was obsolete, wasn't it?-- The 21/31.

Yes?-- Yes, I did.

What did you do about that?-- In the fiscal year '95 budget we applied for the purchase of a Multiwarn - a single Multiwarn system.

And when did you apply for that? Before August 1994?-- The budgeting system with BHP Australia Coal basically starts in the November - in the December - the November/December/January of a year for the next 12 months starting from June.

The end of June probably?-- No, from the beginning of June to the next May. So basically a six month lead up to -----

I understand. Just very quickly tell me about the bonus system. Were the managers, undermanagers, engineers on the same rate of bonus as the deputies and miner?-- That is correct, yes.

You spoke yesterday about Mr Schaus taking the men to task about taking some bottoms in cut-through 13?-- That is correct, yes.

How much of the bottom in cut-through 13 was taken?-- How much of the bottom?

Yes? About 170 metres -----?-- The final cut-through, cut-through 13 has a dimension of seven metres wide.

Yes, but in length?-- Seven metres wide - sorry, and 160 across.

How much of the 160?-- How much of the 160? I think there were actually two sequences that had been taken by the time we actually - by the time they actually got called up to the end office or to the training room.

How much of the 160 metres are we talking about?-- Looking at about 60 to 70 metres.

That didn't happen in one shift, did it?-- No, it would have happened in two shifts.

And an undermanager there at least once per shift to observe what was going on?-- That is correct, yes. At what stage of the shift he actually gets in there, I don't know.

It's common sense, isn't it, that if air goes down a heading inbye and strikes a barrier pillar it's going to slow it down?-- It has a pressure drop at that location, yes.

Just very briefly tell me, why is it that you relied on Cocky Morieson's formula, may I call it, of a start of two with one per week added to it? Why?-- Because he was a more

experienced person in that field than I was. That's as simple as my answer can be, I'm afraid.

That depends, doesn't it, as you well know, on the level of his knowledge?-- He was quite - as you saw in the witness-box he was quite a credible witness, quite a knowledgeable man.

I'm not talking about his credit, I'm talking about how did you know that what he said to you had any foundation in fact at all?-- I had to take his word.

Why didn't you take the word of the available scientific evidence -----?-- I had not -----

----- in preference to Cocky Morieson?-- At that stage I had not thought to involve anyone else.

You didn't want to involve anybody else; is that what you said?-- I didn't ask anyone else.

You only had to look at the book you had, Strang Mackenzie-Wood. You only had to look there, didn't you? Didn't you?-- For the grey area between 10 and 20, yes.

As I understand your evidence there was no graph posted on the 22nd?-- No, there -----

Correct me if I am wrong about that?-- Yes, you are incorrect, yes.

Was a graph posted, the one that had the question mark rise?-- No, it was not. By the time I finished, I think it was close to seven - between seven and eight I posted the graph - the corrected graph with the corrected p.m. reading in the deputies' cabin and also the undermanager's office. I gave Terry Atkinson the graph with the line and question mark on it that same time that evening before I left.

There was none posted on the 29th, no graph posted?-- No, no graph posted on the 29th, no.

Was there one posted on the 5th?-- There was one posted on the 1st for the 29th.

Posted on the 1st?-- Posted on the 1st that had the 29th data on it.

So far as you know it was posted. You did it?-- No, I did not do - I had given that particular graph on the Monday morning of the first to Steve Bryon.

I didn't mean to mislead you. You did the graph and handed it out for distribution?-- That is correct, yes.

Was there one posted on the 5th?-- There was, yes. Again I gave that graph to Steve Bryon which has his signature on it.

In relation to the history of Moura so far as you knew it before panel 512, had there been multi-point monitors after

sealing?-- There had been two point seals - two monitor point sealings in the goafs, yes, in the bottom returns and the top returns for the 511 panel, for the 401/402 panel. I'm not sure about the 403 panel.

Did you not think on your way down No 1 return on 22 July to look behind the stoppings?-- No, I did not.

I have nothing further.

WARDEN: Thank you. It might be an appropriate time to take the break.

THE COURT ADJOURNED AT 3.10 P.M.

THE COURT RESUMED AT 3.50 P.M.

MR MORRISON: Your Worship, I have had the opportunity to speak to Mr Clair and, by arrangement, Mr Johnson is to be interposed and Mr Abrahamse stood down for the balance of the afternoon.

WARDEN: Yes, thank you. Nobody has any objection. We will stand you down, Mr Abrahamse. Tomorrow at 9.15 you will be required to return?-- Thank you.

We will interpose the other witness.

MR CLAIR: Your Worship, I call Gene Norman Johnson.

GENE NORMAN JOHNSON, SWORN AND EXAMINED:

MR CLAIR: Your full name is Gene Norman Johnson; is that right?-- That's correct.

Mr Johnson, you are a welder employed at BHP Australia Coal at Moura No 2; is that right?-- I was up until the 3rd. I finished on 3 February.

The 3rd of -----?-- February.

Now, you had started in the mining industry on 5 July 1972 at the Moura washplant; is that right?-- That is correct.

And you were transferred to Moura No 2 in 1974 and you remained there right through until February this year?-- Correct.

Are you also an honorary ambulance officer?-- That is also correct.

Now, Mr Johnson, were you on shift on Sunday, 7 August of last year?-- I was.

What shift were you working that day?-- I worked the day shift and then I come back in and did the night shift at 11 p.m.

During your spell there on day shift at about 1 o'clock in the afternoon did you have a conversation with Lex Henderson, one of the deputies there?-- I did.

What was the nature of that conversation?-- I just briefly had a few words with Lex and I asked Lex how the situation was down the pit and - in relation to 512.

Did you know what was happening with 512 at that time?-- I did.

What was that?-- It was going to be sealed, put stoppings up and seal the section up. He said to me that the - in fact the sealing was completed in the early hours of the morning, and I said, "How's the situation down there?", and he said, "If we get through tonight, we'll be okay." By that he meant that the gas mixture would have rose and passed beyond the dangerous level.

That's the way you interpreted his words?-- That's exactly how I interpreted it.

You had been at the mine when there had been plenty of other panels sealed; is that right?-- That's right.

Now, you say that you worked the night shift also. Were you there at the mine at about 11 p.m. that night?-- I was.

Did you have a conversation with a couple of people in the crib room?-- Yes, Jeff Taylor and Rodney Buckton, two fitters.

What conversation took place there?-- Well, there was actually no conversation prior to when Jeff said to me something along the lines of, "You don't look so good." I said, "I don't feel bad.", but I just intimated to him that I didn't feel right about the pit, something wasn't right. I intimated to him I didn't think it would be a good night to be going down the pit; I had an awful feeling about it.

Do you know what it was that prompted you to say that?-- Well, knowing the situation in 512 as it was, this was always in the back of my mind.

What did you -----?-- What could happen.

What did you know about 512 at that time?-- Well, I believe that there was a heating and they were sealing it up as quick as possible for that reason.

How did you come by that information?-- Well, I had heard it around the pit somewhere, just word of mouth.

Can you remember in any more detail just what was said to you to give you the impression that there was a heating in the panel?-- No.

Do you know when it was that you formed that view that there was a heating in the panel?-- All that day probably I'd had that feeling, possibly a bit the day before, Saturday. I felt uneasy about the whole situation.

Had you spoken with anybody on the Saturday about the situation in 512?-- No.

Had you been to a union meeting that morning on the Sunday?-- No.

Well, you can't remember in any more detail who you might have

spoken to?-- No.

Or how you might have come by any information to lead you to believe there was a heating?-- Not really. You speak to that many blokes on and off the shift you just - you know, it would be hard to remember who it might have been precisely.

Did you have any view as to when 512 was going to be sealed?-- I knew they were working on it. It was during the days leading up - the day or so leading up to Saturday I knew they were going to seal 512.

Did you know whether it was being sealed according to schedule or whether it had been brought forward?-- No, I could not say. I assumed that it was a matter of urgency because I believe they were working right around the clock on that job.

On the Saturday?-- Saturday, Saturday evening, yes.

Now, you were still at the mine then some little time after that conversation at 11 o'clock and something more happened, someone else came to the workshop where you were; is that right?-- That would be Bobby Davidson you refer to, yes.

And he said something to you. What was that?-- Well, that would be after the two fitters had told me that they were going down the pit. This is normal procedure, we tell one another where we are, and one of the fitters had said to me - I'm not sure which one - "We're going down to 6" - "5 South", I beg your pardon, "going down to 5 South". I just said, "Fair enough.", I knew where they would be, and I went and opened my tool cupboard, got my tools out and carried on with the job I had been doing on the Sunday morning and Sunday evening - afternoon, and I had a large piece of plate cut to shape to fit onto a machine. I picked this up with the overhead crane and was just lowering it into position on the Stamler feeder - that's the machine I was working on - and I heard a voice behind me, "Everyone in the crib room now.", or words to that effect. I looked around, it was Bob Davidson was standing there, and as soon as I seen his face - all the colour was drained out of it and he was actually grey, his face was grey. I said, "Good God, Bob, what's wrong?" He said, "We've lost her, mate, we've bloody lost her." I said, "What do we do?" He said, "Everyone to the crib room straight away." With that we started running. The TA that was over in the next bay cleaning, he run with us. We run across - through the doorway and down past the store and out the ramp heading towards the lamp room.

That was Clarrie Bayles, was it?-- Clarrie Bayles.

Did you notice anything about the atmosphere outside when you got out there?-- It hadn't - I had not seen the atmosphere or the outside the workshop until I run across the road because I was just taken up with my job inside and hadn't occurred to look out for any reason, remembering this is about half past 11 at night, and when I got up onto the roadway you could barely see very far in front of you; it was very murky, yellowy looking, foggy looking stuff. You could smell it, it

was an awful smell, and you could actually sort of taste it in the air. I glanced across to the car park, and they have enormous arc lights there, and it was very hard to distinguish one car from another, and that would be a distance of 60 metres.

Well, where did you go then?-- Went to the lamp room area, or we were told to go to the undermanager's office. As I went past the monitor room I glanced briefly at the monitor and it appeared the screen was showing all red. From there I went around to the - straight around to the undermanager's office to where Michael Squires was.

That screen, you say, was showing all red. You had seen the screen on other occasions?-- I have glanced - generally looked at it, yes, but I have never studied it. I have never been shown the screen actually.

You went around to the undermanager's office?-- Yes.

And who was there?-- Michael Squires was there in the office.

What was he doing at that time?-- He was having a telephone conversation with a person I don't know; I could only assume who it was. I only heard the tail end of the conversation as I went through the door and words to the effect of, "Get out here quick."

Now, some time after that, 5 or 10 minutes after that, two PJB's arrived up at the start point; is that right?-- That's right.

And then George Mason arrived some time after that?-- That's correct.

And were you instructed by Michael Squires to get all the men's names and to check them out and see whether they were okay?-- That's right, yes. I had been told that one young lad, Darren Young, had been involved in a bit of an accident down below and he was suspected of having a neck injury. I checked him out and he appeared to be okay.

Was there then some conversation a little later about getting the ambulance?-- I had mentioned to Michael as soon as he got off the phone had the ambulance been notified. He said, "No." When George had arrived I mentioned it to him again - I beg your pardon, I mentioned it to George, not again, and he in turn asked Michael had the ambulance been contacted. He said, "No." I got the impression that George was a bit upset over this. He immediately instructed Michael to call an ambulance and a doctor and he said to him, "I want them out here now."

Now, the ambulance was called; is that right?-- It was.

And that was about, or just before 10 past midnight?-- That's right.

And it arrived there about 10 minutes later; is that so?-- That's true.

Were you given then a printed sheet by Michael Squires which you understood to be the emergency procedure?-- Yes, Michael handed me this sheet of paper and he said words to the effect that, "You are with the ambulance." He said, "You make sure that the ambulance officers are conversant with this procedure."

And you did that?-- I did that.

And there was some conversation between yourself and the ambulance man about the number of men that were missing?-- Yes, Con Barritt, the OIC of Moura station, arrived with a cadet officer and he said to me, "How many men are missing, Shorty?", and I said, "There was 20 missing originally, nine have come out, leaves 11 unaccounted for."

And then you went on throughout the rest of the night, or the early morning, you coordinated the ambulance and the social workers?-- That's correct.

The doctor?-- The doctor.

The ministers of religion who came there?-- Yes.

I have no further questions of the witness, Your Worship.

MR MACSPORRAN: I have nothing.

MR MARTIN: I have nothing.

CROSS-EXAMINATION:

MR MORRISON: Just a couple of things, Mr Johnson. When you were there on the Sunday, you said you worked the day shift Sunday and came back for the night shift?-- That's correct.

And day shift Sunday the panel had been sealed?-- What Lex said to me was it was finished in the early hours of the morning. I believe that to be the early hours of Sunday morning. That's what I believe, yes.

Now, you were speaking to Lex Henderson, who obviously knew more than you did about the sealing?-- He would have done. He was the deputy.

And the conversation you related with him was that he made some comment about "getting through tonight"?-- Yes.

And you had in your own mind - you didn't ask him what he meant by that, but you made your own analysis of that in your own mind?-- That's correct. That's the way I understood it to mean.

Can I suggest to you that, in fact, he didn't say that to you - that, "If we get through tonight, we're all right.", or, "We're right." He didn't say that?-- Words to that effect, yes.

Words to that effect?-- Yes.

The way you have given your evidence and the way you gave your statement, you have put those words in in inverted commas as if you remembered the precise words. Is that not the case? Sorry, you will have to respond verbally so the lady can take down your response?-- I'm not sure. Do you want me to check with this here?

Well, the words I just read, "If we get through tonight, we're right.", those words are in inverted commas in your statement that the inspectors took, as if to suggest that those were your precise words?-- As near as I could, those were the words.

Something to that effect?-- To that effect, yes.

What Mr Henderson said to you was that the CO was going up a bit?-- Yeah, rising, yes.

And it wasn't of any concern?-- I don't remember him saying it was of any concern, no.

Well, words to the effect, "The CO is going up a bit, but it is not of any concern at the moment."?-- No, I didn't recall him saying that.

Well-----?-- His words were, "It's rising relatively fast and if we get through tonight we'll be right.", something to that effect.

Might it be that he said something to you and you analysed it just as you did tell us before that you analysed it?-- Possibly.

Right. It may be that he said, "The CO's going up a bit, but it is not of any concern at the moment.", and you took that to mean that if you made it through the night, you'd be right?-- Possibly.

I understand. Now, when you saw Jeff Taylor, was Buckton there too, was he?-- Pardon?

Was Rod Buckton there when you saw Jeff Taylor?-- He was in the area, yes.

Let me take one step back for a second. Sorry to jump around. I don't really mean to do it. I'm not doing it deliberately to you, I can assure you. Stay with the day shift for the moment. Did you speak to anyone else on the day shift who had either been down the pit or been on the sealing?-- I quite possibly would have spoken to someone who would have been down the pit, but as to what was the nature of the conversation, I couldn't say, because being in the welding that I am - the repair business part of it - you invariably talk to people over different jobs, so I possibly could have spoken to someone - but not that I can specifically remember - over the closing of 512.

You obviously knew on the day shift that men were, in fact, down the pit?-- Yes.

And that meant necessarily that men were down the pit after the panel had been sealed?-- Yes.

That was-----?-- I believe so, yes.

All right. Now, you didn't think at the time, "Just a minute, men shouldn't be down the pit. The panel has just been sealed.", did you?-- I beg your pardon? I'm a little bit deaf.

Sorry. That's my fault. At the time on the Sunday day shift, it did not occur to you that men should not be down the pit just because the panel had been sealed?-- No, it didn't occur to me.

That has happened in the past routinely, hasn't it?-- That's right.

Nothing that you encountered that day on day shift caused you to think there was any problem with 512?-- Not that I'm aware of, no.

Then let's go to night shift. You arrived at 11 p.m., and in the manner of welders, that's after miners arrive, isn't it?-- No. You say after 11 that the miners arrive?

No, you arrive after them. They get there a bit earlier than you do?-- Yeah, production crews start at 10.15.

About 11 they are heading down?-- They should already be down the face.

When you arrive, you probably go straight to the welding department?-- I do. I go straight to the crib room and that's where Rodney Buckton and Jeff Taylor were.

Obviously on the Sunday night you hadn't spoken to anyone at the mine that would have given you this talk around the mine that you referred to?-- No.

So, whoever that was, that must have been someone on the day shift on Sunday?-- It possibly could have been, yes.

It must have been, if it wasn't on Sunday, unless it was someone around the town?-- I just don't recall when it was exactly, that's all.

I mean, I know you can't recall who and precisely how or what terms they used, but as you understood it, there was talk around the mine by miners that there was a heating in 512?-- Yes.

And that wasn't something you knew of yourself; you had received that from other people?-- That's correct.

Now, you didn't say that to Mr Taylor on Sunday night - you didn't say to him, "Listen, there's talk of a heating in 512."?-- No, that's just what I felt. I felt uneasy about the whole situation.

I understand you had a bad feeling sort of all day about 512, as you tell us, but I'm just wondering why it was you didn't actually say to Taylor, even though you said, "This is not a good night to go down.", or words to that effect, why didn't you say to him, "Listen, there's talk of a heating down there."?-- I don't know. I don't know.

And did you think that you probably should convey that information and/or your feeling to anyone in the management side - Michael Squires, for instance?-- No.

And Michael Squires was undermanager on shift on Sunday night, wasn't he?-- He was, yes.

You know Michael Squires. It is not as if he is a stranger to you?-- That's right.

You know that he is a very approachable sort of fellow?-- Well, I wouldn't know. I never thought about going to see Michael. It was just a personal feeling I had.

You had heard this talk around the mine about what was going on down there. Did you give no credence to the talk around the mine?-- Not really, no.

You thought that was rubbishy scuttlebutt?-- No, I didn't think it was rubbish at all.

You thought there was something to it?-- I thought there was something to it. This has been done before. We have had sealings in the mine before and we have had heatings before.

You were aware of all of that from your experience, weren't you?-- Yes.

You knew the significance of a heating in a sealed panel?-- Yes.

I gather you had been through the '86 era when 5 North was sealed?-- I was.

Why, then, knowing that background and that history and knowing its significance and lending some weight to what you had heard - you didn't dismiss it - why didn't you think it was appropriate to go to Michael Squires, undermanager on shift and say, "Listen, Michael, I've heard that there might be a heating down there. I'm worried about it. I think something ought to be done."?-- Well, I never gave it any thought to do anything like that. Possibly in the back of my mind I was thinking that there are more qualified people around to do those sort of things, you know.

Oh, yeah, but, gee, Mr Johnson, you gave this information some weight, and you had a bad feeling about it all day, you say, and it was enough for you to make some comment to Taylor, but not enough for you to go and tell the bloke in charge what information you had. Well, you didn't even tell Taylor about this talk around the mine, did you, really?-- No, I did not.

When you spoke to him, he said, you know, effectively, "What are you looking so miserable about?"?-- He said something along those lines, yes.

You said what you told us: "Not a good night to go down the pit." He asked you, "Why?"?-- I just said, "I've got an awful feeling about the pit, that's all."

Did you respond to him in terms of, "Look, I'll tell you, Turbo - I'll tell you, Turbo, the 512 is going through its explosive range."?-- No, I don't recall saying that, no. I just said it wasn't a good night for going down the pit.

You didn't think it wise or appropriate to tell him of what you had heard around the mine?-- Pardon?

You didn't think it was appropriate to tell him of what you had heard around the mine?-- Well, possibly it never crossed my mind to mention that. I don't know. I can't say for sure.

That's the very thing that led to this bad feeling you had all day, isn't it?-- Yes, leading up to it, on and off, yes.

Not like a water-diviner where you feel these things in your bones; you felt it because of what you had heard around the mine?-- Well, I had experienced these feelings before, that's all I gave it.

I have nothing further, Your Worship.

MR HARRISON: I have no questions.

MR CLAIR: Your Worship, I just have a couple of questions in re-examination.

RE-EXAMINATION:

MR CLAIR: Mr Johnson, your position was as a welder at the mines?-- Yes.

Did you tend to stick to those duties as a welder, or did you get involved in a wider range of duties?-- No, not really. Just stuck to my own job.

Did you have much to do with what was going on underground?-- No, not really. I just talked to blokes - what's going on. Possibly on occasions we had reason to go down below and either measure up for a job or check for repairs or something.

It was suggested you might go and express your concerns to Mr Squires. Did you see it as your role at the mine to go to Michael Squires with that sort of concern?-- Well, no, not really. As I just said a few minutes ago, I thought there were more qualified people to come up with that conclusion than myself. It was only a personal inner feeling that I had.

Did you have - well, perhaps I should ask you this, first of all: would you have expected that the undermanager might know at least as much as a welder about what was going on underground?-- I should assume he would have done.

And that night did you have any view about whether Mr Squires might at least be aware of just as much information as you were?-- No, I didn't give that any thought. In fact, I suppose it would have crossed the back of my mind that he would have or should have known that. He was the undermanager.

I mean, you had your concerns-----?-- I did.

-----you have told us. Did you have any view as to whether, if Mr Squires had those sorts of concerns, he might then go ahead and do something about it himself?-- No, it did not cross my mind.

Didn't even think about that?-- No.

Thank you, Your Worship.

EXAMINATION:

MR NEILSON: Mr Johnson, just one question: you said you have heard talk around the mine about the fact that there may have been a heating. Did you derive that from your conversation with Mr Henderson or did you hear that elsewhere?-- I got that, I think - someone must have been mentioning that prior to - I was talking to Lex. He never mentioned the heating. He just mentioned the gas mixture was rising.

Okay. So prior to your conversation with Mr Henderson, you were aware that there was a possible heating in the mine?-- There was a possibility of one there, yes.

And when he said to you - or words to this effect, as you have said - "If we get through the night, we're all right." - did you relate that to the fact that there was a heating?-- I related it to - the only way I took it to be was that the gas mixture would rise to its peak of its explosive range and then what I would term would taper off.

So, when you then said to Mr Taylor, "Don't go down the pit tonight.", and then said, "I don't think it is a good night to go down the pit.", is that what was going through your mind when you made that statement?-- That's correct, yes.

The fact that there was a heating?-- Mostly because I would imagine - in my mind was the rising gas mixture, yes - something along those lines. That's just the feeling I had. I felt very uneasy about it all that day.

Thank you.

EXAMINATION:

MR ELLICOTT: I understood you to say in evidence that George Mason handed you the emergency plan; is that correct?-- No, that was Michael Squires. That was one for the ambulance.

Had you seen that emergency plan before that?-- No, I hadn't read it or seen it. I knew of an emergency procedure that did exist for the mine.

You knew one existed. You weren't involved in its formulation?-- No.

Were you aware that you may have a role to play in the execution of that plan?-- I may have done, yes.

So, you would have known before that night that you may be involved in what was in the emergency plan?-- Well, being a safety officer or first-aider, I should imagine that I would

have done, yes.

But you hadn't seen it prior to that occasion?-- No.

Thank you. That's all.

MR CLAIR: I have no further questions, Your Worship.

EXAMINATION:

MR PARKIN: Just one question, Mr Johnson: did anyone at the start of this shift tell you that 512 was to go through the explosive range?-- Did anyone tell me it was going through?

Yes?-- What, on that night?

Yes?-- Lex Henderson told me 1 o'clock that afternoon or thereabouts that it was expected to go through the range some time during the night, and if we get through the night, that would be all right.

But there was no-one from management ever said at the start of the shift that 512 was going through the explosive range during the shift?-- No, I did not know. I never saw any management on the night I started. They are approximately 200 yards away from the workshop, so-----

Thank you.

MR CLAIR: I have no further questions, Your Worship. Perhaps Mr Johnson can stand down?

WARDEN: Thank you, Mr Johnson, you may stand down. You are excused.

WITNESS EXCUSED

WARDEN: I don't think it is possible to start another witness at this stage this afternoon.

MR CLAIR: I do have another witness there, but he is not likely to finish in 10 minutes and may not finish in 40 either, Your Worship. I am at Your Worship's-----

WARDEN: No, I think we will have to terminate proceedings and recommence tomorrow morning at 9.15, gentlemen. Thank you.

THE COURT ADJOURNED AT 4.20 p.m. TILL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 16/02/95

..DAY 27

THE COURT RESUMED AT 9.24 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR MARTIN: I would like to tender as part of one exhibit document 1 of the inventory extracts - not extracts, consecutive pages numbered 17 to 26 inclusive of the Mine Record Book, being the manager's weekly inspections commencing on 8 April, ending on 5 August 1994.

WARDEN: Bear with me a moment. We have a problem with exhibits. One from yesterday wasn't formally admitted. The one from yesterday will be admitted and marked Exhibit 159, the Maihak Computer Operator's Manual, and the documents you have just referred to will be admitted and marked Exhibit 160.

ADMITTED AND MARKED "EXHIBIT 159"

ADMITTED AND MARKED "EXHIBIT 160"

MR MARTIN: Thank you, Your Worship.

WARDEN: Thank you, Mr Harrison?

Witness, you are still under your former oath. Do you understand that?-- Yes, I do.

CROSS-EXAMINATION:

MR HARRISON: Mr Abrahamse, when Mr Morrison questioned you on Tuesday, he asked you about the origin of the various graphs that we used when you had the conversations with Dave Kerr on 22 July; do you recall that?-- Yes, slightly, yes.

At one stage you touched on the graph for the CO make for 5 North back in 1986?-- That is correct, yes.

In that context you made reference to Michael Squires having had some involvement in the preparation of the graph?-- That is correct, yes.

Was it your understanding that Michael was a technical assistant back in those days?-- That is correct, yes.

Was it also your understanding that these particular graphs were prepared some years after the event?-- That is correct, yes.

And were they prepared from various records that had been kept relative to 5 North?-- That's correct, yes; GFG samples that were taken at the time, yes.

But certainly it wasn't the case that as at 1986 there had been any CO make kept as such?-- No, that is correct, yes.

Did you understand Michael's involvement in the preparation of graphs went beyond 5 North and involved some of the other panels that may have been sealed?-- No, I'm not aware of that.

The only one you were aware of was the fact that he had actually prepared the graph for 5 North?-- That is correct, yes.

If I can turn to the events of the 22nd of July generally and, more importantly, the follow-up in terms of the various readings that were taken and placed in the deputies' log?-- Yes.

Was it your understanding that as at 22 July and again for those few days that the readings were logged that Michael Squires was away on holidays?-- Yes, I am understanding that's the case, yes.

Is it your understanding that he didn't get back to work until about 1 August?-- That is correct. I went underground with him, I think - I beg your pardon, yes, I did realise that on 1 August, yes.

Is it the case that at any stage after he got back you told him at all about what had happened on the 22nd of July in terms of the CO make and the - and what's been described as a false reading?-- No, I can't recall if I had told Michael, no.

And similarly I take it you have no record of telling him about the decision to keep an eye on the CO make and the decision to keep those readings in the deputies' log book?-- No, I did not make reference to that to Michael, no.

And similarly again, I take it, you had no recollection of telling him that some discussions were had about doing the CO make perhaps on a shift basis or at least on a daily basis after 22 July?-- That's correct.

If I can turn to something else? You mentioned to Mr MacSporran yesterday that you had got to know Col Hester from SIMTARS?-- That is correct, yes.

Was that mainly through Moura No 2's involvement in the CAMGAS scheme?-- I met Col in 1992 when he was installing the CAMGAS system, I think - yes - or the CAMGAS - or CAMGAS and SEGAS -

the two monitoring systems.

There has been evidence that that was installed about December 1991. Would that be roughly about right?-- Sorry, I don't know.

You thought it was 1992?-- Well, I was there in 1992, yes.

In any event, you got to know him fairly well through that contact, did you?-- I knew of Col Hester. He knew me, and he showed me what the system was capable of doing, but other than that - I had very little contact other than that.

He told you what the CAMGAS system was capable of doing?-- For sending information to Brisbane, yes.

I think you agreed with Mr MacSporran yesterday that you found him quite helpful?-- Col was a very approachable fellow, yes; very helpful, yes.

Now, in the course of this contact you had with him when he was being quite helpful, did he ever complain to you or point out to you the fact that it appeared that the gas chromatograph was hardly ever being used for testing purposes?-- No, he did not, no.

Did he ever indicate to you that it may be advisable to use the gas chromatograph in any particular circumstances?-- No, he did not, no.

More importantly, did he ever suggest to you that it was something which should have been used as a matter of course?-- No, he did not, no.

Perhaps if I take that one step further: as a matter of course, at times when different panels were about to be sealed, up to the point of sealing?-- No, he did not.

I take it also that since you have been at No 2, you have had fairly extensive contact with different members of the inspectorate?-- That's correct, yes.

Have any of the officers you have dealt with from the inspectorate ever made any complaints to you about the lack of use of the gas chromatograph for testing purposes?-- No, no-one has made any complaints to me.

Or have they ever made any suggestions to you along the lines of what I said before - about the use of the gas chromatograph at times leading up to the sealing of panels?-- No, no-one has, no.

Mr MacSporran suggested to you yesterday that since about 1987 the emphasis in relation to the interpretation of carbon monoxide levels has been on the CO make as opposed to the CO parts per million?-- That is what he said.

Since the time you've been there, has anyone from either the inspectorate or SIMTARS ever discussed with you the CO make in

any particular panels and the relevance of the CO make in those panels?-- SIMTARS haven't discussed any CO makes in any of the panels. I can't answer that for the inspectorate. I don't remember if we did or we didn't.

More importantly, if I can deal with the graph for the CO make for 512, the one starting, I think, in late February, from memory, and the one that was updated fortnightly originally and then later on weekly?-- Yes.

Did anyone from the inspectorate or SIMTARS ever discuss the relevance of the levels in that particular graph with you at any time?-- No, no-one discussed them with me in particular, no.

More importantly, once it reached the levels that it did by about mid June and from thereafter onwards?-- No, no-one discussed - the department or SIMTARS never discussed that with me, no.

Did anyone from the department ever discuss with you the methods that were being used to monitor gases, particularly carbon monoxide build-up in panels?-- No, not that I can recall, no.

If I can just turn to one final point, Mr Macsporran questioned you yesterday about a possible defect in the Unor system because of those oxygen readings; do you recall that?-- The oxygen analyser, yes.

Now, to your knowledge did any of the people who dealt with the Unor on a regular basis, and I may refer to deputies or undermanagers, for example, did any of them to your knowledge have any belief or any idea that there may have been any defect in the Unor system up to 7 August?-- No, I can't answer on behalf of them because I wasn't aware of it myself.

I take it you weren't aware of it from the questions yesterday, but were you aware of anyone else having any belief or even any doubts as to the reliability of the system in that sense?-- Not in the reliability of the system, no, but they hadn't questioned - no-one had questioned the oxygen, the 20.4 to 20.6, no.

So no-one to your knowledge was aware of any possible defect along the lines of what he questioned you about yesterday?-- That's my impression, yes.

Thank you. I have nothing further, Your Worship.

RE-EXAMINATION:

MR CLAIR: Mr Abrahamse, just a few matters, you mention in the course of your evidence that the high methane readings that appeared from point 18 on Sunday, 7 August - you will recall seeing those set out on an exhibit, Exhibit 127 - may have been caused by - at least you advanced this as a possibility at least, that a - victaulic seal did you call it?-- That's correct, yes.

A victaulic seal could have been blown on one of the gas drainage tubes; is that right?-- The gas range, yes.

Gas range?-- Yes.

However, you didn't seem to think that that was very likely because at that stage you wouldn't have expected that there would be a high pressure in that gas range?-- The assumption I made in making that statement is that we had the month before experienced greater pressures in that gas range than we were exhibiting on that particular weekend, but not to say that there would be a possibility that the seal could be damaged in some way and just physically deteriorate and then possibly leak at that stage, it's a possibility, or whether maybe one of the stands that the gas range was placed on could have collapsed. I mean these are all "could have" circumstances which would break one of the seals in the victaulic gas range.

In any event, the accumulation of methane at that level that was indicated - perhaps the witness should see Exhibit 127, please, Your Worship. The existence of methane at the levels indicated there could well have been a problem in that area; is that right?-- The levels were - sorry?

If you have a look at Exhibit 127 I will indicate them to you. If you go about half-way down the page, Mr Abrahamse, you will see two point 18 alarms there, one showing an alarm value of 4.55 and the next one 4.59; do you see that?-- Yes, that would cause me some concern.

Were there any other occasions that you were aware of - just pausing for a moment, I think you are aware that there are then a number of further methane alarms at point 18 that day. If you run down the page you will see another one at 4.5, 4.38 and later 4.36. So they are all around that same level?-- Yes, yes.

Were there ever any other occasions, as far as you were aware, when there were problems with methane being tested through the monitor point 18?-- Being tested?

With problems - problems, I should say, with higher levels of methane through the samples taken at monitor point 18? Was this a point that gave regular problems -----?-- No.

----- in respect of methane, or was this something quite unusual that on this day there are a number of methane alarms?-- That four percent level would give me concern because that would not be a normal reading at all, no. I do remember Mr Tuffs on - not a number - I can't recall the actual events, but on a few occasions, where he required that monitor to be calibrated, but they were certainly not to those levels. They would have been to levels between one and two per cent, definitely not 4.5 per cent.

While you have that exhibit there I want to ask you some other questions in light of some of the matters you have been asked about in cross-examination. In particular can you go back to

that series of readings for point 16 commencing on 2 August and it would be the - the first of them would be the sixth reading on the page. Do you see that?-- Yes.

Point 16, 512 top return. Now, that shows that there was an alarm level, a set point value of 7 ppm there which was breached with a reading of 7.17?-- That is correct, yes.

At one minute past six on the 2nd?-- That's correct.

By rights, if the system was operating correctly then that should have caused an alarm to ring and the alarm to be de-activated and then the alarm on the Unor. When I say cause an alarm to ring, it should have caused a siren to sound and then if the system proceeded as it should have the siren would be de-activated and then the alarm on the Unor accepted. You will see, of course, that the acceptance time there is shown as 9.54, but let me ask you this first of all: you were there on the 2nd or were you not? You were at the mine during that week?-- That is correct, yes.

Was there any mention to you of any concern as a result of a CO alarm in the 512 top return on that day?-- No, there was not, no.

Were you aware of any concern on the part of others that day as a result of an alarm or even the sounding of a siren resulting from an alarm on the 512 top return?-- No, I was not, no. I don't normally get to work until about between quarter past and half past six.

I appreciate that, but you didn't arrive to -----?-- To a siren.

To a buzz of concern or excitement about a CO level being breached to cause an alarm for the 512 top return?-- Not that I can recall, no.

If you look at the next line you will see that it relates to an alarm at nine minutes past 11 on 3 August and at that stage the set point value is eight, that's the second last column you see?-- Yes, I can.

So in the intervening time between the alarm on the 2nd and the alarm on the 3rd the set point value has been raised to eight?-- That is correct, yes.

You will see that it was breached with a reading of 8.8 on that occasion?-- Yes.

Do you see that?-- Yes, I do, yes.

Now, let me ask you this first of all: did anybody mention to you that there had been an alarm with a breach of an alarm level of 8 ppm?-- No, I was not aware of that.

In the top return?-- No, I wasn't.

If it had been mentioned to you would you have been concerned

about it?-- Yes, I would have.

And you can say that pretty well off the cuff, can't you, because you know that 8 ppm or above 8 ppm would calculate at your normal air quantities through to a reasonably high litre per minute make?-- That is correct.

Nobody ever mentioned it to you?-- No, I was not - honestly not aware of it, no.

If it had been mentioned to you and you were concerned, what would you have done about that?-- The first thing I would have done was to find out at that parts per million what was actually occurring ventilation wise, quantity wise underground and that would have to be established first and then something to be determined from that.

Now, of course, if you did do that, if you had taken that sort of step then I suppose there was every chance that you would have discovered at that point that in fact the deputies were taking readings shift by shift on the Drager tubes and taking air quantities readings; is that right?-- There would have been a good probability that I would, yes.

And that would have been some time around the middle of the day on 3 August; is that right?-- That is correct, yes.

Could the witness see Exhibit 152, please, Your Worship? Just before we go specifically to that, let me take you back to the previous day. The set point value of seven was breached with a reading of 7.17, you see?-- Yes.

If you had been told that there was an alarm for 512 top

return with a reading of 7.17 ppm, would you have been concerned then?-- That's all relative to the velocity and what was actually occurring down there. I mean, that's -----

As a starting point?-- As a starting point -----

Would you have been concerned if you had been told that there had been a siren sounding and that there had been an alarm level breached on the morning of 2 August?-- A 2 to 3 ppm jump would alert something to me.

So, you are saying at 7.17 that would indicate to you that you should look at it further?-- There is a possibility.

And, of course, if you looked at it further at that stage, you might well have looked at the deputies' reports showing the readings for 1 August, that's the parts per million and the velocity readings for 1 August?-- If something like that occurred, people would have asked Steve Bryon obviously to go down and, being the acting ventilation officer, to go see what was happening down there, yes.

What I am suggesting is you might also have discovered, either through Steve Bryon or in some other way, that in fact the deputies were monitoring it from shift to shift at least to the extent of taking the necessary readings?-- There's a possibility, but I still was not aware of that on 1 August.

But if there was an alarm being investigated, you might well have become aware of it, mightn't you?-- There is a possibility I would have because that alarm is an operational thing and the undermanagers and deputies around that undermanager's room would accept or - would accept that type of alarm.

Well, have a look at 152, the second last page there, and go, first of all, to the calculation of the readings for 1 August, and you will see that the first reading on 1 August, Drager tube readings of 7 ppm, calculated through to 17.03 lpm?-- That is correct, yes.

The second shift, the day shift, on 1 August, the readings calculated through to 18.94 lpm?-- That is correct.

And on 2 August when this alarm registered at the Unor and when the siren at least should have sounded, those figures were available then and there to be calculated from the previous day, weren't they?-- They were, yes.

And as far as you know, nobody ever did that?-- No.

But if they had done it, then they would certainly have been aware that there was something happening in the panel, isn't that so, with the calculation of litres per minute of 17.03 and almost 19 the previous day?-- Those two values would give you an indication that something needed to be done, but looking at the shifts on the 2nd and the 3rd, to put that into context, we were back down in that 13, 14 lpm again as we did

on the 22nd when we reached 18.9.

Well -----?-- To put it into context - to put all those numbers into context.

On the 22nd your explanation was that the reading of 8 parts was clearly wrong?-- On the facts that we had presented to us, yes.

But here we have got two consecutive shifts calculating to 17.03 and 18.94 respectively?-- A reason to investigate, yes.

You wouldn't be so ready to write off two experienced deputies, Bob Newton and Doug Moody, as being wrong in their readings, would you?-- No, I would look into it a lot deeper.

We will come back to Exhibit 127, the alarm sequence there, and go to the next day, 3 August, where we have, as I say, an alarm breached at 8.8 at 9 past 11 in the morning. Now, of course, we can see from that exhibit there that that alarm wasn't accepted until 5 past 7 that evening, about eight hours or so later; you see that?-- That is correct, yes.

Now, you don't know a lot about the Unor, but we have been told that until that alarm is accepted, then further readings which breached the alarm level won't create any alarm or cause the siren to sound?-- That is the understanding from Mr Robertson, yes.

Now, I just want you to have a look at another exhibit which is volume 1 of the annexures to Exhibit 5. Your Worship, if the witness can see that. If you go to page 11 - go to the body of documents which set out all of those readings, and you will see page 11 of 26 there for point 16, 512 top return - point 16, 512 top return?-- No, point 18. Page 11 of -----

Go back to point 16, you will see that up the top. That's a little way back from there?-- Point 16.

And then go to page 11 of 26 as it's called. About 10 lines up from the bottom on that page you will in fact see the record there of the 6.01 alarm on 2 August - not alarm but reading on 2 August which is rounded off in that total to 7.2; you see that?-- Sorry? Yes, 6.01, yes.

Yes, 6.01?-- 7.2.

7.2, okay. Then go over to page 14. Just as you go through there you will see from that point on that the readings that are shown in the CO parts per million are almost consistently above 7; do you see that, which would tend to indicate that the alarm level was - at the time that that alarm was accepted, that the alarm level was shifted to some higher figure than 7, and then follow that through, if you would, to page 14, about 12, 13 lines down from the top, and you come to 3 August at 11.09 which in fact corresponds with the alarm that is shown on Exhibit 127; you see that?-- Yes, I do,

yes.

And you will see that that shows the value of 8.8 which has clearly breached that new alarm level of 8 ppm?-- That is correct.

That alarm is registered on Exhibit 127; okay?-- Yes.

But then you see that there are following that two other readings which are above 8. There is 8.8 and then one of 8; do you see that?-- Yes, I do, yes.

And you won't see any corresponding alarms shown on the alarm log, Exhibit 127?-- Yes.

Have you looked at 127?-- Yes.

There is no corresponding alarm there?-- No.

And the reason there is no alarm is because that first alarm wasn't accepted; is that right?-- Yes.

Following -----?-- Following from what Mr Robertson would say, the scenarios that he set forth, yes.

So that in fact we have an alarm level of 8 set, it's breached by one alarm but that alarm is not accepted, and then we actually have two more breaches immediately after that of the alarm level of 8 but no alarm registered, and, of course, obviously no siren going off; is that right?-- That is correct on the Exhibit 127.

And this is on the 3rd. You were there at the mine on the 3rd?-- I was, yes.

Do you recall hearing any alarm even - any siren even for the first one at 11.09?-- No, I don't. I don't recall it.

Well then, if you follow through in Exhibit 5 that log of the point 16, 512 top return, you will see that the 8 level is not breached again for some time; in fact, through until 5 August '94. Now, 5 August, we are talking about the Friday when it's shown in that table that at 12.50 there was a level of 8 that was breached, right?-- The second last line, yes.

The second last line?-- On page 17, yes.

And that registers as an alarm on Exhibit 127, the alarm log; you see that, the next line down from the last one we were looking at - 5 August, 12.50. It shows an alarm level of 8 breached in fact by -----?-- 8.03.

8.03 which is rounded up to 8 in the table in Exhibit 5. So that again, by rights, at 12.50 on 5 August, that's 10 to 1 in the afternoon, there should have been a siren sounding telling everybody at the mine within earshot of the siren that there was a breach of the CO level in 512 top return. Now, were you there on 5 August?-- I was there on 5 August, yes.

Do you remember any siren sounding that day?-- I cannot recall if I did, no.

Now, irrespective of whether you heard a siren sounding, if somebody had come to you at 10 to 1 on 5 August and had said to you, "Jacques, we have got just over 8 ppm in the 512 top return.", what would have been your response?-- I would - the first thing I would have asked for is what velocity were we getting down underground.

Again, if you had asked that, you might have discovered, either through Steve Bryon or somebody else, that in fact the deputies were taking the velocity every shift?-- I had discovered on that day - well, not discovered - I had obtained that - on that day a CO make from Steve Bryon at 2 o'clock that afternoon.

Yes, that's right?-- I was, you know -----

At 2 o'clock. The alarm goes off at 12.50, 10 to 1?-- That's the time that I received it on the surface. I do not know what time Dick Stafford actually took that reading underground.

With alarms going off and sirens sounding as they should have done, surely somebody would have resorted to these readings that the deputies had been taking shift by shift. I mean, there should have been some real concern and excitement about what was happening in the top return, shouldn't there? By rights, a siren should have sounded at this stage on three occasions during that week, and in fact would have sounded more often if the Unor had been reset, would have sounded at this stage on five occasions, five occasions. Now, wouldn't somebody have discovered that the deputies were in fact taking readings shift by shift so that the CO make could be calculated? It's a matter of commonsense?-- Maybe other people were aware of it, but I've got to say in all honesty that I wasn't.

I don't want to be jumping from exhibit to exhibit all the time, but it is the only way we can do it. Look at Exhibit 152, because if at 10 to 1 on the Friday the sounding of a siren and an alarm on the Unor had prompted people to have a look at what was being registered by deputies shift by shift, they would have found that on Thursday, 4 August, the night shift, again Bob Newton, an experienced deputy, had found 7 ppm which calculated along with the air volume to 16.57 lpm. Have a look at that. I notice you are nodding your head. That is correct, isn't it?-- It is correct, yes.

And then they would have found that Doug Moody, on the next shift, again an experienced deputy, had registered readings that calculated through to 15.65 lpm; isn't that right?-- That is correct.

I mean, these readings are well above what you would regard as the comfort zone, even on yours and Mr Morrison's suggestions that you could run up to 14. They are well above it, aren't they?-- That is correct, yes, they are.

Then, on the next shift, the afternoon shift on 4 August, Steve Bryon, again an experienced deputy who has no difficulty reading Drager tubes, according to some of the evidence, registered readings that calculated out again to 16.57 lpm - that's on the Thursday afternoon; do you see that?-- That is correct, yes.

And then on the night shift of 5 August, which, in fact, would have been before 10 to 1 on that date, you have Bob Newton again taking readings which calculated through to 16.57 lpm?-- That is correct, yes.

And it seems that nobody - sirens, Unor alarms or otherwise - nobody was ever prompted to go and calculate these figures through to find out what the sirens were all about, if, in fact, sirens were sounding, or at least what the Unor alarms were all about; is that right?-- Well, I was not made aware of them, no.

Do you know of any possible reason why people wouldn't be acting on those sirens if they were sounding, or at least on the Unor alarms that were coming from the 512 top return on that day? Is there any explanation you can think of?-- The only explanation I can think of is when - if the siren did alarm, people would go straight to the parts and they would not have seen a significant jump - you know, the two to three parts in the parts per million - to make the comparison from the previous reading. This is an assumption on my behalf, but accepting the alarm and maybe not accepting - or accepting and resetting correctly, as Mr Robertson told us, that is a possibility, and looking at the parts per million, which most of the people obviously were - well, from the Inquiry would take notice of - not the CO make - they were complacent with that level of parts per million. That's my only explanation. I can't give - and that's only my opinion.

Well, Mr Abrahamse, given all we have heard about the difference in attitude towards parts per million, vis a vis

litres per minute that came about in '87/'88 when people realised the important thing was litres per minute, who could possibly, on Friday, 5 August - this is last year - simply act on the basis of the parts per million in light of an alarm ringing in - or registering at least out of that 512 top return? Who would do that?-- Obviously alarms are set by - the alarms that were set were set by people that were complacent with - not complacent - that were familiar with that parts per million level. I mean, that's the only explanation I can give.

Let me take you to that, because if you look at Exhibit 127, you will find, in fact, that while the alarm was obviously raised from 7 to 8 back on the 2nd of August - that is, somebody made a conscious decision that it was acceptable to go to 8 ppm - the alarm was not raised above 8 the next time that it sounded or was registered. It stayed at 8 right through until sealing had commenced on 6 August, so that whoever it was that set that alarm at 8 back on 2 August formed a conscious view on each occasion after that that 8 should be the alarm level - 8 should be the alarm level?-- Should be the next level, yes.

Yet when that 8 level was breached, there doesn't seem to have been any real activity directed to investigating it properly, does there?-- Obviously I'd say that at that point the alarm was accepted and maybe not reset and then accepted on the Unor screen and then never alarmed after that - after the 3rd. I don't know. That's an assumption again on my behalf.

After the 3rd - well, it is obviously left at 8 after the alarm on the 3rd, isn't it, because it is the 8 level that's breached on the 5th at 12.50?-- That's correct, yes.

If we look at that then, we will see also that the next alarm breaches a level of 8, so it seems to have been left at 8; do you see that?-- Yes, that's correct, yes.

That alarm at 12.50 was accepted at 13.06 on 5 August; do you see that?-- That is correct, yes.

We see that it was left - or seems to have been left at a level of 8, but, in fact, if you go to page 17 there at 26, the line second from the bottom in Exhibit 35, you will see that the readings that are coming through are above 8; do you see that? You get 8.1 at the bottom of the page and down the next page you find they are consistently above 8; they are getting higher and higher. You get down to 22 minutes past 5 on 5 August, this is the Friday afternoon, it is actually up to 9.3; do you see that?-- Yes, I do.

But we don't seem to have any alarms registered on the Unor?-- No, obviously we were between - the 8 was obviously set as the low limit, understanding Mr Robertson, and the high level was still set at 10, looking at the value below it when the next alarm went off. So, initially you would have been going through the lower - what they call the L1 - what Mr Robertson called the L1, and 10 is the L2. I am only making assumptions. I am looking at this while I'm sitting here.

That's right. That could only happen if the alarm level was in fact left at 8. That could only happen if the Unor hadn't been properly reset to accept alarms?-- That's correct.

On the low level?-- On the low level, yes.

So, what we have, in fact, is that the low level is consistently breached all the way down page 18 - that's going from 5 August at 16 minutes past 1 in the afternoon, we actually have it breached with a level of 9.2 at 9 minutes past 5 in the afternoon - 9.2. What would you have done if somebody had come to you and told you that there were 9.2 ppm of CO in the 512 top return on Friday afternoon?-- Again, like I said, the first thing I would have done is check the ventilation - like the reading I obtained from Steve Bryon that Dick Stafford took, it was a velocity of 1 metre per second and a parts per million of 7. That indicated a drop in quantity because the 520 was taking some air to clear the gas and obviously there would be a rise in parts. That's the assumption I make.

A velocity of 1.55, isn't it?-- No, 1. Oh, is it 1.55?

Yes, 1.55?-- Yes, sorry.

That was an unusually low velocity and you have explained why that is so?-- Yes, that's right.

You wouldn't just rest on that, would you, if you knew that you had your parts per million going up over 9?-- Not if your parts - your calculation of 1.55 at 9 - I haven't done the calculation, but obviously it has been done somewhere, has it - would give-----

Well 1.55 at 9 is going to give you somewhere - I haven't done the calculation, but it is going to give you somewhere around about 16 or - do you want to do the calculation?-- Yes, please.

Okay, here's a calculator here?-- Have you got the cross-sectional area?

The cross-sectional area is 21.92?-- It is 18.3.

18.3. 18.3. So even if you worked on the velocity as it was when Dick Stafford took his reading, then quite clearly you would be well and truly above any comfort zone, wouldn't you?-- That is correct, yes.

And you really - at 5 o'clock or so that afternoon, when that reading of 9 came in - what did I tell did you - 9.2, yes - at 9 minutes past 5 that afternoon, you really couldn't even rely on the fact that the ventilation would still be as low as 1.55, could you?-- No, it is an assumption. It could be lower or higher. I wouldn't know.

You would be down there measuring it, wouldn't you? You would be down there?-- To determine it, yes.

With your CO in parts per million over 9 out of the 512 top return, surely, Mr Abrahamse, you wouldn't be casual enough to be saying, "Oh, well, we only had 1.55 quantity back in the middle of the day today. Let's calculate it on that."?-- No, no, the absolute value of 18 would be investigated, like it was on the 22nd, that's right.

But we have got a string of them?-- I know.

We have a string of them; not just one reading of 8 ppm, a whole string of readings, which if they had have been calculated that week would have indicated clearly that something drastic was happening in the 512 panel; isn't that so?-- That's correct, but the reading that I would have posted didn't exhibit that unfortunately, but it didn't------

That's so, it didn't. That doesn't mean you wouldn't investigate it if somebody told you there were 9 ppm?-- No.

The next reading at 22 minutes past 5 that afternoon is at 9.3 ppm. I'm looking at page 18 on 26 in that Exhibit 5?-- That's correct.

The next reading at 35 minutes past 5 that afternoon was 9.2?-- That is correct.

19.05 that evening, that's 5 minutes past 7, it's at 9. At 7.44 that evening, it is at 9 again. At 7 minutes to 10 that evening, it is at 9.1. At 10 minutes to 12 that evening, it is at 9. Just after midnight it is at 9 again. Do you see all those?-- Sorry, I lost you.

Just after midnight, that's the third line from the bottom, or 42 minutes - that's almost quarter to 1 in the morning-----?-- Yes.

-----it is at 9 again; isn't that so?-- The other ones were 8.8 and 8.9, but, yeah.

Sorry, which were 8.8 and 8.9? Just before that?-- Yes.

From 10 to 12 for the next hour it is hovering just around 9 or below it?-- Just below it, yes. It is splitting hairs. If you have got it in parts per million, you are splitting hairs, aren't you?

Why is it at this stage that we don't have any alarms being registered on the alarm log? We should have alarms being registered on the Unor system and we should have sirens going off like mad in the middle of the night?-- The only other - I don't know. Was 10 the lower - did we have a method of determining whether 10 was the lower limit set? I don't know. That's the impression you would get.

You might say that, except that the alarm log shows that in the morning at 7.49 there is a set point value of 8 which was breached with a reading of 8.33; do you see that?-- Yes.

That's on Exhibit 127?-- Yes.

That's at 7.49 in the morning; do you see that?-- Yes.

8.33. Do you know why it could be that all of these intervening high readings - all of them just about are above 8, and a number of them, which I pointed out to you, are, in fact, 9 or above - why they weren't producing a siren and an alarm on the Unor?-- My only assumption from that was that 10 was set as the low limit.

Well, if that was so, why is it then that we find that we have a breach at 7.49 in the morning of a set point value of 8?-- Well, between those two times - at 7 - between 7 in the morning and the 20.21 it would have been changed - the lower limit would have been changed from 10.

Yes, we can see that plainly, but I'm talking about the alarm that registers at 7.49; that breaches a set point value of 8?-- That's correct, yes.

So that clearly, at that time, there was a set point value of 8?-- That is correct, yes.

Now, all of these other figures higher than 8, and in particular the seven or eight of them that are higher than 9, occurred before 7.49 in the morning. Do you just want to follow that through? On page 18 or page 26 of Exhibit 5, you see?-- Yes, obviously between 7 o'clock and 2 o'clock in the afternoon it was-----

Don't jump ahead of me, Mr Abrahamse. I'm talking about those readings that I drew your attention to overnight - the ones up to midnight, and then following midnight. That's on page 18, you see?-- Yes.

That's on the 5th and the early hours of the 6th - the early hours of the Saturday morning, right - and then on the next page, page 19, if you follow down the page you will see that consistently again it is above 8, until you come down to 7.49, which is about point 6 down the page, just past half-way down the page - 7.49 - and you find that you have got a figure of 8.3 registered?-- That's correct, yes.

If you go to your alarm log, you find that that 8.3 or 8.33 on that log breaches a set point value of 8; do you see that?-- Yes, I do.

Now, I asked you how that could possibly be so - that all of these higher readings have been coming through and no siren sounding, it seems, and no alarm registering on the alarm log?-- On the 6th?

For a start, I think you suggested that maybe somebody put the set value above 8?-- Yeah, or things didn't get reset.

Or the other alternative was that it wasn't reset?-- Yes.

It wasn't reset?-- Yes.

So, through what turns out to be a crucial night, this crucial night on the Friday and early Saturday morning, we've got - following, in fact, a series of alarms during the week in 512 top return - we've got these consistent levels that should have breached the set point level if it was there set at 8; isn't that right?-- That is correct, yes.

No alarm registering at all on the Unor and no siren sounding, it seems; is that right?-- It seems from the log - you take that from the log alarm, yes.

One of the suggestions you made is that perhaps somebody put the set point level up from eight to something else. Couldn't have been to nine because we have a number over nine and nine would have been breached?-- That is correct.

But first of all, do you think its likely that anybody would have put the set point level up from eight to 10 or even 9.5?-- I don't know. There is a possibility. I don't know.

If you had been asked at that stage whether it was safe to have a level of 9.5 or 10 ppm in the 512 top return what would have been your reaction?-- That is the Saturday morning prior to sealing.

Friday night through to Saturday morning. Friday night - we have been through all that?-- You would ask the question, but you would also have to determine what actually was flowing through that panel. That's a crucial - that is a question, yes.

It would prompt you to look at all the readings that had been taken during the week and you would find litre per minute makes from the deputies' readings that would cause you a very great deal of concern?-- Just physically determining at that point what was being made, that would be a concern enough, and then to verify the Unor point at that stage to see if that is actually what you were getting.

Put it this way: if you had been consulted would you have said, yes, it's satisfactory to have an alarm level on the Unor of 9.5 or 10 as from that time on the Friday afternoon, that time of 10 to one on the Friday afternoon?-- If we were in the process of sealing it -----

No, but you weren't?-- I wasn't consulted and I wasn't -----

But you weren't in the process of sealing it on the Friday afternoon, were you?-- No, we weren't.

Then we come to the alarm at 7.49 on the morning of 6 August and it seems that after that at least that the set point level was increased to 10 because the next alarm breaches a set point level of 10 some time that afternoon or that evening?-- That's correct, yes.

21 minutes past eight that evening by which time sealing is well and truly under way?-- That is correct, yes.

And in fact if you look at that Exhibit 152, during the night shift, 6 August which was the Friday night, through to the Saturday morning, Mr Newton had taken a set of readings on that occasion which calculated through to 18.94 lpm; isn't that right?-- That is the calculation, yes.

So by the time that alarm went at 10 to eight on the Saturday

morning or thereabouts breaching that set point level of eight those figures there were available too, weren't they?-- They were, yes.

And nobody, it seems, bothered to calculate them through even though there were these alarms on the Unor?-- No.

So it seems?-- So it seems, yes.

Just briefly, you were dealing with - could the witness see Exhibit 109, please? While that's being obtained, you were dealing at one stage with the practice in relation to using either the Maihak readings or the Drager readings to do the calculations for the graph?-- We were using the Maihak readings to calculate the CO make.

And your practice was to use the Maihak readings, and I think you told me that generally speaking the Maihak average, weekly average was a bit above the actual Drager tube reading; is that right?-- Just a little bit, yes. I mean either - we just have to remember when we talk in CO we are talking parts per million. That's quite important. The context of taking parts per million to the second decimal point doesn't really - I don't think it really has great significance when you are talking parts per million.

It's relative, of course?-- It is relative.

But there were, of course, those occasions when the Drager tube reading was substantially above the Maihak reading, and I wanted to ask you what you normally did in those circumstances?-- Either Allan - when Allan would do his Friday reading it's fairly - the reason why he used the average for the week was because of the possibility of having machines on a Friday or any other day that he did a reading or a vent survey to establish his - you know, the whole trend for the whole week to get a representative sample for that week of parts per million?-- Yes. I can't say what he did on particular events where they were higher, but there weren't - I don't think there were too many of them.

There were a couple there?-- There were a couple there.

That date, for instance, the 16th, you find that you had a Drager tube reading of five against a Maihak reading of 3.6?-- I don't know. In hindsight if we had -----

First of all let's establish - am I reading that correctly?-- There is a parts per million of five, a Maihak of 3.6, that is correct. In hindsight, analysing or ripping these documents to shreds, we should have had a comment column down the far right-hand side maybe, to indicate that sort of stuff. Sorry, I can't answer that.

On that occasion, of course, it was calculated on the 3.6 rather than the five?-- That is correct, yes.

That's really one thing that led to that dip down in the graph?-- It would do, yes.

And then the next week, the 24th, the Maihak reading was 4.5 and the Drager tube reading was 5.5 which is a substantial difference; isn't that right?-- One part difference, that's correct, yes.

But one part difference would translate through to a reasonable difference in your litres per minute calculation; isn't that right?-- Yes - I mean it would. I can give you an actual figure -----

Okay then. Just do a calculation for the 5.5 at velocity of 1.6, and I think I told you the cross-section was 21.92?-- It's a 2.1 lpm difference.

So it would be 12.51 rather than 10.41?-- Yes.

All of these factors could have quite an effect on the way that graph looks, couldn't they?-- Yes, looking at your parts per million with the Drager tube reading too. I mean, you say between five and six. They really are rounding off figures, aren't they, with the reading of the tube. It was good that Allan was the only person doing that at that time because at least he was consistent in the way he would do it, but there was consistency in that compared to maybe if I took a reading and then he took the reading the next week, you know? There would be a difference.

The consistency also leads to some inconsistency too, doesn't it -----?-- Yes, there is a definite -----

----- in the graph?-- That's right, could lead to an inconsistency.

I just want to touch on one matter in relation to the ventilation in 512. You said, I think in answer to Mr MacSporran, that the ventilation in that - you were answering some questions at least in relation to the ventilation in the bottom corner as we will call it of 512, that's the southern corner, the southern triangle?-- The southern triangle, yes.

The southern triangle of 512, and you mentioned that one way to address that was to open the holes in the stoppings between No 1 and 2 headings. I think you said that that was addressed in that way?-- Yes, that's the way I learned that Allan Morieson addressed that situation, yes.

When that happens, when the holes are put into the stoppings in that corner does that necessarily then affect the ventilation in the balance of the panel?-- It would have - there would be a different quantity of air. I cannot - I wouldn't be able to say an actual quantity, but that would go around the bottom - the bottom end of that panel, yes.

It would change the quantity of air that would go the normal route down around through cross-cut 13 and cut -----?-- But no air actually went all the way around the bottom. Because the way we designed those bottom stoppings, each of those

stoppings had a regulatory device like the door, a role up flap so that you had the ability to roll sections up. Obviously the door in the bottom corner of that triangle would have been opened up more than the door at the bottom end of the panel. So it's to allow that flow through.

Necessarily if there were additional openings created to flush out that southern triangle that would reduce the amount of air flow in the other areas of the goaf adjacent to the southern triangle; isn't that so?-- It would do that, yes.

Because new migration paths for the air would be opened up?-- That's correct.

And the air would tend to take the easiest route which would be out through the new openings and that could well have an effect on ventilation in the areas - particularly the areas adjacent to that southern triangle?-- I can't quantify that, but that's the general principle, yes.

And that in turn could lead to some differences in - when those openings were made, differences in what was coming out of the goaf, isn't that so, could make some differences in the kinds of mixtures, assuming that you might have, for instance, in an area adjacent to the southern triangle, assuming for the moment that there might be in that area some sort of heating, then if there was ventilation taken away from that area that might affect what was coming out up the top return because you get new migration paths for the air?-- Yes, yes.

And equally if those holes in stoppings were closed, that in turn could affect the migration paths and result in perhaps something more being picked up from areas adjacent -----?-- That is correct.

----- to that southern triangle, and equally if there was an inspection, for instance, occurring and somebody was going down the top return and opened up the doorways between 1 and 2 headings to go in and have a look or rolled up flaps and had a look in, all of those things could, on a temporary basis, affect the air flow through the various areas of the goaf?-- That is correct, yes.

Because when a doorway is opened up new migration paths are created therefore the air takes the easiest route and it goes that way and -----?-- There is definitely a time period related to that. I mean if you walked anywhere in any underground mine and walked through a stopping via a door you obviously will feel a rush of air go past you as you go through the door, but it doesn't alter the ventilation of the panel. There is a time period that has to be associated with opening a door or closing a door and those - like you call them, temporary alterations. You would feel a rush of air but that's all there would be.

The temporary alterations could have some effect on the migration paths on a temporary basis even a short-term temporary basis?-- No, I don't think they would have a significant impact on the flow of air throughout the panel. I

mean the mining practice, the general mining practice anywhere is if you go through a door, ensure that it is closed, but I don't think you make drastic changes to the ventilation as a panel by opening a door for only two or three minutes and then closing it again, no, but if it was for a prolonged period of time, say maybe a shift or more, yes, you would then have a change of - not a change, you would have more air leaking through that stopping, yes.

And if steps are taken from time to time to, say, flush out some area of the goaf, put a bit more air here or there then those steps, you say if they were in place for a time they would change the migration paths?-- They would change the migration.

They may change what is being picked up by a flow of air that is coming back out through the top return?-- That was my first instinct when David Hill went down was why have these stoppings got holes, but you do not alter something that's already established because you don't know why they are there.

And I think whether for that reason or other reasons, I think you've agreed earlier in your evidence, that there can be - in terms of different mixtures of gases coming out the top return there can be these short events, I think I suggested that to you in evidence-in-chief -----?-- Mr Highton proves that too.

Where for some reason or another there might be just a short-term event involving a particular gas that might not be continued through any length of time?-- Possibility, yes.

I did ask you in your evidence-in-chief and you've been asked some further questions about it, about the effect of these short-term events and the way in which they might be measured on the Unor or even on the Drager tubes; do you remember me asking you questions about that?-- The plug theory?

Yes?-- Yes.

I just want you to have a look at this diagram so that it might be more readily apparent as to what can happen. It may just help to illustrate the matters that you've spoken of. There are copies available for the panel, Your Worship, and my friends. The first of the diagrams or the illustrations there represents what we will call an event involving a particular concentration of carbon monoxide over a shortish period of time. You will see it's one that spans in total about nine minutes. Do you see that, concentration of carbon monoxide growing over that period up to 10 and back - from six up to 10 and back down to six again starting at about the third minute and finishing around the 12th minute?-- Yes, I can see that.

And then the next illustration shows diagramatically the taking of a sample with a Drager tube. I think you said that the sample period for a Drager tube is between three and four minutes?-- That is correct, yes.

I think that illustrates about a three minute period?-- Actually if I can make a clarification on that, I actually got

a gentleman to do 10 presses with a 21/31 the other day and it's three minutes 20 seconds for 10 exact pumps, so that's why the three to four minutes would be -----

This represents about three minutes and you will see that looking at the first sample period in the second illustration there, that if you did take a sample at a time when the CO concentration is increasing with this short event, that in fact you are going to get a mixed result, a mixture between the six at which it started and the 10 at which the event - or the maximum of 10 which the gas concentration reached during that event. Do you see that? You will get a result of 8 ppm if your sample period only covers the rising stage, do you see?-- Yes, I can see that illustration, yes.

And then, of course, you could have a Drager sample taken

which altogether misses that increased concentration, and that's illustrated on the same line where you will get a result of 6 ppm and showing nothing at all of the increased carbon monoxide. That's the second illustration and right-hand sample period?-- Yes, I can see that.

The third illustration is the sampling with the Maihak system which samples one minute in every 13; is that right?-- That is correct, yes.

And you can see that, of course, that could miss the event altogether, as is illustrated there?-- That is correct, yes.

Or like the Drager sample, it might get a mixed result if it were sampled at some point during the rise or the fall?-- That is correct, yes.

I tender that, Your Worship?-- If I could just make one comment. I think people like SIMTARS would be better to - they would be more experienced to analyse that illustration than someone like myself.

Yes, okay, but that at least shows as an illustration of the sort of thing that you were talking about in your evidence-in-chief; is that right?-- This is your theory of a plug, yes.

I think you have agreed with it at that stage?-- It is a possibility, yes.

MR HARRISON: Your Worship, could I just ask that it be placed on the record the origin of the document?

MR CLAIR: It's a diagram that's been produced by counsel assisting the Inquiry. I don't think that it needs any further description than that.

MR MORRISON: I agree with that.

MR CLAIR: I am following a good precedent in saying that to Your Worship.

MR HARRISON: I am not involved in that scrap. I would just like to know who has prepared the document. If it's counsel, I would accept that.

MR CLAIR: I have given the description, Your Worship. I don't know that Mr Harrison is any more successful than me in ascertaining the authorship of documents, Your Worship.

WARDEN: It will be admitted and marked Exhibit 161.

ADMITTED AND MARKED "EXHIBIT 161"

MR CLAIR: Mr Abrahamse, one final matter: touching on this question of communication, you were asked a number of

questions during your cross-examination about communications within the system at the mine, either deputy to deputy or deputy and management. Now, I think you said that there was some work being done on a new form of report, deputies' report in particular, at some stage either by yourself or by other members of the management team?-- It was very much in its infancy. Mr Schaus was in the throws of discussing with the unions changes in work practices. When or if that evolved - and, I mean, things like that can take 6 to 12 months - when it evolved, one of the things that we wanted - one of the things we wanted to do was to try and set up a system where the deputies became more - gained more ownership of what they were doing underground. That was the theory and the idea behind it. That's what we were developing too, so the deputies would look after their panels not only as a safety officer, which they did at the mine, but a safety officer and planning what they wanted to do with their section over the next day. So, they looked at the shift they were working on, as well as the possibility of the shift tomorrow, and that would give the undermanagers the ability then to look at the week as a whole, to plan for their work as a whole, and then it would give the likes of myself or George Mason, the undermanager in charge who planned the general week, to look further than that, and then it gave me the ability to plan, physically plan, for the three months, the dream sheet stuff, you know, for three months, six months, two years.

Although you are not expecting deputies to have too much input on the longer term planning?-- No, deputies had - the deputies had a good say in what some of our longer - longer term planning was going to try to be. BHP Australia Coal set up what they call MCC consultative groups and they were issues like safety, productivity, there was industrial relations.

These were long-range things?-- They were subgroups, yes.

I want to come back to communication at the mine?-- This is part of it, sorry.

Yes, sorry?-- Part of the communications, this system was - I will give an example of the productivity issue. The deputies were involved in establishing the cut and flit mining system, the miner drivers and the deputies. Trying to nurture that type of ownership and responsibility to develop that system was being developed, and then once these industrial relation issues were to be solved, the deputies were to look after that.

Can I turn to another side of it? Was there any consideration given to communication in respect of past events, that is, keeping a record of things that had been reported in relation to the workings, in relation to particular panels, in relation to underground operations?-- I suppose that really fell into my category. I had done that on the pillar stability side of things, looking at reports.

What about on -----?-- But issues on -----

What about on a day-to-day basis, because it seems to be

emerging from the evidence here that one of the problems is that the wide range of people who needed to know about events that had occurred in 512 Panel simply didn't. I mean, you are one example; there were a number of things you didn't know?-- That is correct.

And everybody in the management area may well have suffered from the same disadvantage, that they didn't all know everything they needed to know. Now, was that sort of matter addressed, that is, this question of ensuring that everybody knew what was - everybody who needed to know did know what was happening?-- I suppose the established system was deputies reading their previous shift's reports, and all those reports were put on the noticeboard in - at the stand. I mean -----

I don't want to dwell on this, but you can either agree or disagree with this proposition, that that system didn't work in these circumstances, it seems?-- It is quite evident that it didn't work as well as it should have, yes.

You are a person that has obviously addressed this question of organisation either on a long-term or - both on a long-term and on a day-to-day basis at the mine?-- We were in the throws of addressing it, yes.

But you yourself obviously were involved in that sort of thing?-- Yes.

In terms of the future, do you have any view as to what sort of system can be established to enable everyone to be kept up to date?-- One of the most important things, I think, is the start of shift, end of shift overlap as the most critical thing.

Well, that leads to oral communication but no record?-- No, oral and written communication. That allows you to - allows an undermanager to communicate with the deputies as a group so that the deputies would understand what was happening in the rest of the operation. I have experienced this at Crinum where I was for two weeks. From the development of a 24 hour plan, that 24 hour plan would then be discussed with deputies prior to the shift starting, they would come in early and would leave a little bit later, and allowing that oral communication which they required as well as this 24 hour plan as well as a general weekly plan.

What about a way of registering items that indicate danger or some basis for concern in a panel: the smelling of smells, high CO readings, high CO make, possibility of people seeing a haze, that sort of thing? Now, there doesn't seem to be anything more than a haphazard system of communication in relation to those matters. Has that ever been addressed?-- With regards smells and hazes and that and as far as Mr Martin's exhibit of - that graph, I mean those are all visual aids that would assist in people making judgments.

What about the prospect of some kind of software program that enables these things to be registered, in effect, as alarm matters in respect of a particular panel? Is that feasible?--

Computers are good but somebody - we are talking the human element here - has to input that information into the software and, therefore, we come back to the original problem, the human.

Can deputies' reports be designed to ensure that there is data on there that is, as a matter of course, input to a system like that?-- Yes, I find the word "adequate" in ventilation conditions appalling.

Okay?-- And we should be able to ask our deputies, instead of being descriptive, to be quantitative. That is one thing that I think needs to be addressed.

A range of quantitative readings so that deputies don't have to be creative in what they say but simply responsive to questions, in effect, already posed on the deputies' reports, is that a start?-- That's a very good start, yes.

The entry of data into a system that registers the normal information but also registers what might be called alert items or alarm items?-- Once developed - once you develop facts, those are quantitative measures, you can then get criterias or limits which are important.

And in respect of alert or alarm items, a system which keeps those registered in alarm mode until they are accepted, accepted by somebody with a particular pin code or specified code number indicating that a person at a particular level of responsibility has become aware of those alert or alarm items; is that feasible?-- It's a part of very stringent accountability on everybody's behalf, deputies and including miners and engineers and undermanagers.

I take it from what you say that sort of system is feasible?-- It is definitely feasible, yes.

Thank you, Your Worship.

WARDEN: Thank you, gentlemen. You covered a fair bit there, Mr Clair. I want the witness to go as soon as possible. I will just check around the Bar table if anybody has any need for this witness any longer.

MR MORRISON: Yes. Did you want to let him go right now?

WARDEN: No, I want to let him go as soon as possible. You have some matters for him?

MR MORRISON: Yes. I must say, I had assumed the panel would probably ask him some questions.

WARDEN: Yes. It's a short day today, I want an early lunch, so we might have the break now. Adjourn for about 15 minutes.

THE COURT ADJOURNED AT 10.54 A.M.

THE COURT RESUMED AT 11.12 A.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

WARDEN: Mr Morrison, it has been suggested that the panel go first and then you can tidy up after that.

MR MORRISON: I am content with that, Your Worship.

EXAMINATION:

MR PARKIN: Mr Abrahamse, your duties included production scheduling, monthly reports, statistics, monitoring ventilation, methane drainage, to mention a few?-- To mention a few, yes.

You stated that when you arrived at Moura No 2, looking at your duties, you would be very busy?-- Yes, that's right.

I think it was mentioned earlier that Phil Reed actually asked for a full-time engineer before your time?-- Before me full-time, yes.

That's before your time?-- Oh, before my time.

Yes?-- Yes, at different stages Phil Reed and George Mason would request technical assistance in different areas, yes.

I guess before your arrival did you believe that Moura No 2 would be under-resourced in terms of technical staff?-- With regards technical staff?

Yes?-- Yes, I'm sure it was.

What about after your arrival?-- I effectively created my own position from the Graduate Scheme.

I meant really, you know, you were a graduate when you arrived at Moura?-- That is correct, yes.

I guess you were on a very steep learning curve yourself?-- That is correct, yes.

So, do you believe that you were under-resourced, or-----?-- For the different aspects at Moura No 2 underground I had to deal with, I feel that was the case, yes.

Who did you report to?-- To Albert Schaus.

You reported directly to the manager?-- That is correct, yes.

So, who was in charge of ventilation?-- There was a ventilation officer, and he reported to George Mason and Albert Schaus.

You reported to Albert?-- That is correct, yes.

I guess we will come back to it, but it's a bit confusing as to who is actually responsible for ventilation at Moura No 2?-- The tree, I suppose, when you talk about resources-wise, there weren't very many branches to hang off, you know, twigs from there on in. We were a fairly small organisation and therefore a multi-disciplined organisation, if you can call it that.

I mean, you got no authority to instruct the ventilation officer, for instance?-- From a coal mining industry, I had not even obtained a statutory qualification, no.

No, I'm talking in terms of technical matters, not from a statutory point of view. I mean, for instance, you couldn't say, "Look, we need to reduce that quantity of air or increase that quantity of air.", or whatever?-- No, I did not do that, no.

Because obviously, as well as his ventilation duties, it has been stated that the ventilation guy had stone dusting and fire fighting?-- And fire fighting, that's correct, yes.

Can you tell me then, with all that in mind that you spoke of, how the ventilation aspects of the mine were controlled and, indeed, communicated?-- The controlling would be done via the undermanager in charge and his undermanagers, and when alterations were made, sometimes they were placed in the undermanagers' book. So, the undermanagers' book is what you would call the system where you would identify those things.

I guess it is a bit difficult when you have got all the deputies making the reports and you have got the undermanager in charge, and I guess yourself, involved in ventilation, and indeed the manager. I guess what I'm looking for is some kind of a system so if, say, a stopping is breached or a regulator is knocked down, as was the case, and it wasn't communicated to anyone, how do you pick that kind of problem up?-- The first question I'd ask is what is placed on a deputies' report, because the system in place was that the undermanagers would read the deputies' reports that were given to them at the end of shift and if there was information on the deputies' reports, they would either place that on their report, or not at all, you know. It would be a decision for the undermanagers to write in that book. That undermanagers' book was then the focus for myself, surveyors, other undermanagers, even some deputies and the manager to reference.

But, I guess, when you look at, for instance, a regulator door being breached, I mean, that's fairly serious business and it would require somebody to orally discuss that with someone-----?-- Yes.

I don't think that happened. I guess that's why I'm coming to

the communication aspects?-- The example - if I could use it - is on the 5th when the layering was encountered. I don't know what was written down, but I - the system would have been that somebody either on night shift or day shift would have reported layering, and then reported it to the undermanager in charge who would have then designated a deputy to increase the quantity of air down in that panel to remove the layering. Again, like I said to Mr Clair before, quantitative issues on deputies' reports would be of significant - a significantly improved system so that they would analyse what actually happened.

Sure. The point I'm making is that when deputies report things, it is the management's duty to ensure that those things are communicated?-- The undermanagers would read every deputy's report, that's correct.

And it is their business to communicate it to others?-- To others, that's correct.

Did you ever work a ventilation plan at Moura No 2?-- Yes, we did.

You had the plan at Moura No 2 which showed the progressive Unor monitoring points?-- That is correct, yes.

And also the ventilation quantities at any time?-- There was a map in the monitor room - a general statutory map that the surveyors would put up. They would do - I don't know, their monthly or six monthly additions. The Unor monitoring points would be placed on that. The ventilation, as a visual monitor - as a visual plan, was in Allan - on Allan Morieson's board and his monthly ventilation reports were in that area too.

So, if I was to ask you, as being responsible for some aspects of ventilation at Moura No 2 - if I was to ask you after the incident for a working ventilation plan, both before the sealing with all the quantities on it and with all the Unor points on it, you would be able to give it to me?-- Not a map with all the quantities on the map itself, no.

Why not?-- The fire officer - I don't know why not - I don't know.

I'm just trying to get to the facts, that's all, because what I'm trying to suggest is this: that unless you do have a plan for these things that we've previously mentioned on them, it is very difficult to monitor the ventilation of the mine. Would you agree with that?-- I would agree with that, but there was the monthly report with - in the area of where the ventilation report was. A bord and pillar operation doesn't advance as quickly as, say, other areas in other mines do, but - and that information - that system was there, where part of the QA system you have monthly reports in that, as well as where the map was of the current monthly return system.

Okay. I'm just trying to - I think I'm trying to make the point that one of the things that we could have asked for as a panel is the ventilation arrangements before the sealing with

all the ventilation quantities on the plan, and, indeed, the Unor points, and also the situation after the sealing, because obviously when you seal 512 off you affect all the other areas in the mine; is that true?-- That is correct, yes.

And obviously if ventilation changes are made also, it is difficult to calculate them without a working plan?-- Without someone physically quantifying every vent station point.

Can you tell me - you have mentioned methane drainage?-- That is correct, yes.

Who was in charge of methane drainage?-- Phil Draheim would have been the gentleman who was in charge of the project on Moura lease, if we can call it that. He was located at the open-cut, which was some distance away. I would have been in charge of the methane drainage on a day-to-day basis at the underground.

So, you did all the - basically all the work associated with methane drainage?-- At the underground - on a day-to-day level, yes.

So, that's a fairly sophisticated business as well - that methane drainage at Moura?-- Yes, it is.

And I believe is conducted very well?-- Yes, I think it is, yes.

And that would mean that you would be very busy?-- The methane drainage itself would - aspect would at least consume at least 60 per cent of my time, going through my diary, at least.

How are aspects of methane drainage again coordinated?-- The co-ordination was basically - we had the luxury of only having two shifts drilling: day shift and afternoon shift, and I was there for both those shifts on a daily basis. So, if there were specifics that required - specific instructions required on a day-to-day basis, I was available, but otherwise I would brief the undermanager in charge on - during our 24 hour meeting.

Did any deputies at any time complain to you of any problems in 512 with regard to re-circulation or indeed dead spots or dead zones?-- No, no-one complained about dead zones, no.

But you know now, of course, that there were complaints in that area?-- Other than listening at the Inquiry, yes.

So when ventilation changes were made there they were co-ordinated, you were part of that co-ordination; is that what you are saying?-- When ventilation changes -----

When changes were made underground?-- No, I would not be, no.

Would you be notified of those changes?-- No, I wouldn't, no.

Why not?-- Because it was the undermanager's responsibility to co-ordinate shift changes, shift changes on the ventilation.

What I mean is shouldn't you know about those changes?-- When changing regulators?

Yes?-- I tried to at least devoid myself of some of the operational aspects, but if they were major changes like installation of the overcasts I would be made aware of those bigger plans, but not on a shift by shift basis.

I think when you were cross-examined by Mr Clair you said something about the Graham's Ratio and it was actually on your computer screen?-- That is correct, yes.

I think you mentioned also that you didn't know anything about the Graham's Ratio?-- I had read it in the two weeks preliminary training, yes, but that's - I hadn't really - before the incident I hadn't taken much notice of it, no.

You didn't ask anyone about the ratio itself?-- No, I didn't, no.

Do you think you should have done in retrospect?-- In retrospect I should have, yes.

I guess in Mines Rescue - I think you would have gone through this Spontaneous Combustion in Underground Coal Mines by Howard Jones; did you see that document?-- No, I did not, no, not that I can remember.

The blue book. It is the blue book at the mine. It was a publication for notes for mine management on spontaneous combustion in underground coal mines?-- The red and blue book?

I think this was called the blue book. I think it was the blue book?-- No, I had not seen that at the underground operation, no, that blue book.

You had never seen it in Mines Rescue training?-- No, I did not see it in the Mines Rescue training, no. The only literature we were given on Mines Rescue training was the

Mackenzie-Wood -----

When you arrived at Moura No 2 did anyone ever mention to you about spontaneous combustion?-- Yes, they did.

So you did know that the seal was liable to spontaneous combustion?-- That is correct, yes.

And obviously you knew about 5 North being sealed because of a heating?-- That is correct, yes.

And you knew that Moura was a gassy mine obviously?-- That is correct.

Can I just refer you again to Exhibit 21? I think it's 15 pages from the front. You've seen this graph before many times?-- 18/8?

Yes. It starts from 28/2 through to 6/8?-- That is correct, yes.

It's been referred to before, so I will be as brief as I possibly can. On the 16th the goaf was flushed and I think the reading up there was about 7.32 lpm; do you see that?-- Yes, I do see that at 16/6, yes.

Then on 15/7, and I accept the fact and Mr Morrison pointed it out previously that it wasn't plotted beyond the 15th at that time, but assume that on 15/7 we have got a reading of 14.59 lpm?-- That is correct, yes.

It's fairly obvious to anyone that the litres per minute has increased - it's doubled in a month. Did that lead you to any concern at all at that time?-- No, it didn't lead me to any concern because when I arrived back - on 15/7, when the reading on 15/7 was taken, if you took all that information from there up to 8 August taking out the peaks and troughs it looked like a constant rise. I didn't take it in its absolute value because of my - just looking at the graphs in 401, 402 that did have peaks and troughs in it.

But I guess it's a fairly steep rise in four weeks, isn't it?-- That particular - in four weeks it is a steep rise, yes.

Because it's been said previously that you know with your Mines Rescue training that over 10 you've got a problem and you need to investigate it?-- That is correct, yes.

So we probably should be investigating that from 24/6. Dave Kerr in his evidence stated that - I don't think he actually saw that graph. Do you know of that? On the 22nd did Dave see this graph that we are looking at now or any graph up to the 15th?-- I know I walked into the room with the log. I'm not sure if I had the graph in my possession at the time, but I don't think - don't know if I showed Dave Kerr that particular graph. I don't know.

Because on the 22nd when there was so much concern about CO I

think Dave went underground with yourself, you had a visit underground?-- That's correct, yes. I'm just not sure if I showed him the graph or not.

He also said in his evidence that if he did see that graph and if he had known about the benzene type smells that had been reported and also the haze, that he would have suspected a heating. Do you agree with that now?-- I do agree with that, yes.

Did you agree with that then?-- No, I wasn't aware of a heating at that stage. I was - we went to check the parts per million. I did make reference to Dave to ask him if there was anything I should be smelling, understanding that the graph that he had shown me, if you had a very sharp rise is an indication that there is a heating, and I was just looking for clarification. I had not smelled anything like that in my time. I just wanted confirmation on that. So he was aware what he was looking for or possibly looking for.

Can you tell me then why the graph was not plotted right up to 6 August since there was concern about it?-- Beg your pardon?

Can you tell me why this graph wasn't plotted right up to 6 August because the undermanager, I believe, had said that you were going to take shiftly readings and plot it?-- That is correct, yes. I can't answer that. I wasn't there at the time or asked why - the log itself that I had established finished and that was as far as I thought it had gone on, to that Tuesday.

Because you would agree with me that the whole point about plotting a graph is to monitor the trend?-- That is correct, yes.

Could the witness be shown Exhibit 158, please? Mr Abrahamse, I'm just using this exhibit just purely as a reference point for the total quantity in 512 on the 15th and the 22nd and the 23rd of July. You will notice on 15 July when we have a CO reading of 14.5 litres per minute the total quantity of air in the panel at that time was over 57 cubic metres per second; is that right?-- That is correct, yes.

And then you can see also on 22 July the quantity was reduced by 10 to 47?-- That is correct, yes.

Do you know why that was?-- No, I have no explanation for that.

And then on the 23rd it was reduced a further 10 cubic metres to 37. Do you see that?-- On the 23rd?

On 23/7 it comes down to 37.7?-- Yes, I see that, yes.

Do you know why that was?-- No -----

It may be a bit unfair to ask that question. I guess the reason for the 37 was the fact that the bottom return was closed?-- That's correct. I was just going to say I had

understood that Mr Barraclough was going to ask Mr Mason if we could close that bottom return off, that is correct, yes.

I guess the question that I've got really is that when we close the bottom return off, now in a few days we have reduced by 20 cubic metres per second, that's a fair bit of air in the panel, do you think that could have any effect at all on the CO readings? I'm eluding to this graph here that we looked at previously on the make because you will see on that graph there is a dip from the 15th up to 5 August. I'm just interested if you know the answer to that question?-- No, obviously an assumption on my behalf is the reduction in quantity and elimination of parts in that would reduce your quantity.

You state in your evidence that you did not know if 512 had been sealed; is that right?-- That is correct.

Why is that?-- I had not been informed over the weekend -----

But I mean if you got duties regarding the ventilation at Moura No 2 and somebody decides to seal the panel, its sealing - I guess it's brought forward?-- The sealing is brought forward.

We know that is a reason for bringing the sealing forward; wouldn't that be significant to notify you as being part of the management team, the sealing off?-- I wasn't involved in mining operations as much as, say, the undermanagers and undermanagers in charge. So someone made a conscious decision not to worry with me.

Do you know why the sealing was brought forward?-- I understand from the Court that it was brought forward because of an apparent haze and smell that was evident on Friday night.

you stated during Mr MacSporran's cross-examination that on 22/7 if you had been aware of smell and haze being reported and an increase in CO make that you would have had a problem; is that correct?-- In answer to Mr MacSporran I think I said even if you had 5 lpm and you had a smell and a haze you would investigate it, yes.

You have stated in evidence that the deputies would come and

talk to you about problems, any problems they might have?-- Yes, yes.

And you had good communications with them?-- I did. I thought I did, yes.

Well, if that's the case, can you tell me - can you answer this question - I will quickly run through these - in June McCamley talks about a slight tarry smell; Robertson on 24 June, he got an unusual strange smell; on 5 August Caddell noticed a tar smell; on 6 August Klease on one, two, three occasions talked about a smell and a haze; on 6 August Stampa, he was on the sealing process, he complained about a smell on the ground that he had never smelt before; on 6 August again Young says when he was sealing he could smell a benzene-type smell or a haze; Graham on 6 August said he detected a very faint odour that reminded him of fire stink, and again on the 6th Tuffs noticed a definite stink. Now, all those reported instances of smells and you don't know anything about it, you had never heard of any smell or any tarry smell or haze or anything else?-- Out of all those instances I wasn't at the pit for any of them, and, no, they didn't - nobody came up to me, not even Mr McCamley.

I mean, when you were there on 22 July?-- Yes.

There were instances in June, early June, from McCamley and Robertson?-- There were two, yes, yes. No, they didn't, they did not, and I associated with Mark on the surface well and he never said anything to me, and that - on the 22nd Reece Robertson was the deputy and he said nothing to us.

So, you were there on the 22nd, and just jog my memory: when were you at the mine before the incident?-- When was I at the mine?

Yes?-- When I was an annual leave? I came back on 6 June - 11 July was when I returned and then I was away again - I was sick for four days after that.

What were those four days again?-- 26 to 29 July, I was away for four days sick.

So, you were there during the time I am speaking of in August when these - although it was the 6th?-- It was the 6th, yes, I was not there on that weekend.

Well, I guess the final point is - and it's a point raised by Mr Clair - how would you describe communications at Moura No 2? Would you say that they were satisfactory or unsatisfactory?-- Well, obviously from evidence here there is pertinent points that were unsatisfactory, but we were developing systems to improve 24 hour and seven day a week communications to all people.

Thank you.

EXAMINATION:

MR NEILSON: Mr Abrahamse, what would you consider your level of knowledge about spontaneous combustion to have been prior to the incident? I mean, if I was to ask you the question prior to the incident, what would you tell me?-- Very limited. Limited I would say, as being a very descriptive word, limited.

But you undertook training at the Mines Rescue Brigade; you did a two week course?-- That is correct, yes.

You learnt about spontaneous combustion there?-- I learnt how to make - how to calculate the CO make, yes.

And what the CO make meant?-- In terms of the 10 parts - the 20 litres - 10 litres and 20 litres, that's correct.

Did you understand what produces spontaneous combustion?-- Development of carbon monoxide, yes. We studied mine gases in their absolute terms, yes.

Do you know what - how would you describe the production of carbon monoxide? What is it? What is it a product of?-- It's a product of a fire, possible heating, an application of diesel machinery underground, and just a general oxidisation of coal.

Well, if I was to suggest to you that it is a product of incomplete combustion, have you heard of that term?-- Incomplete?

Combustion?-- I have not heard of the term.

You have never heard it described that way?-- I haven't heard of it described as such, no.

You have been asked many questions about this, and I appreciate that, and I understand your answers, but you have relied, or you have indicated that you relied heavily upon advice from Mr Morieson that there would be an expected increase in carbon monoxide levels due to the actual mining of coal?-- Yes.

More coal being exposed, more loose coal?-- More loose coal being exposed, yes, and the type of extraction that we were using, yes.

But would you agree with me that the actual production of coal doesn't necessarily relate to increases in carbon monoxide?-- No, I will disagree with you on that. It is my opinion - it is my opinion, yes.

You have already said that carbon monoxide is a product of oxidisation?-- Of oxidisation of loose coal, and that increases with the surface area of smaller particles of coal.

Now, do you understand in what circumstances oxidisation takes

place?-- Yes, obviously at increased temperatures - this is from information that I understand now - at increased temperatures you get a higher rate of carbon monoxide production.

So, in what circumstances in an area such as 512 Panel would you get increased temperatures?-- In your goaf. It was natural in all goafs.

And why then would it be in a goaf?-- Beg your pardon, sorry?

Why would it be in a goaf? Why not in a main roadway?-- Obviously because it's an area that's increased - you have increased the volume - the space that you have in the goaf.

Okay, and it would have something to do with less ventilation, wouldn't it?-- Reduced velocities, that is correct.

In an area like a goaf with, you know, decreased velocities, larger cross-sectional areas, how would you expect whatever ventilation is there to perform?-- The principal reason for ventilating the Moura No 2 goafs was for the removal of methane which the seam developed and any other seam gases that it produced. If you didn't ventilate the goaf, because Moura seam is so gassy, there was a greater - it was deemed well before my time that there was a greater potential of - or greater problem if you didn't ventilate the goaf to remove that methane.

But the question I am asking is: in ventilating a goaf such as - and, I mean, you might like to have a look at the model behind you because it's very easy to see that?-- I am aware of the model, yes.

And I appreciate the reasons for ventilating a goaf and what you were trying to achieve, but it's impossible to get a smooth flow, even flow of ventilation through a goaf such as that, isn't it? I mean, let me ask it another way: there would be dead spots?-- There is a possibility that there would be dead spots even where you left the stub or the stook on the corner; there is a possibility of that.

Let's not talk about possibilities, let's talk about probabilities, and have a look at some of those stooks you have left there?-- Yes, there were stooks left there to safeguard the men from intersections.

What I am putting to you is: there would be dead spots, wouldn't there?-- There is a possibility, yes.

Can you explain to me how you would - just please turn around and have a look -----?-- I am quite aware of the model.

Let's take one of those stooks?-- Yes.

You explain to me how you would ventilate the oblique little corner, right, in one of those stooks that are sitting there?-- It would be difficult, yes.

Well, it would be more than difficult, wouldn't it? In fact, you would actually have to go down and erect a brattice screen to direct air in there, wouldn't you?-- With a heading that is eight metres wide and then consequently 18 - 16 metres wide, you would get low velocities; I am not arguing that point. I could not honestly say that you would - that you wouldn't get dead spots there, but, similarly, I couldn't say that you would because I didn't go into those areas, you weren't game to.

You are a mining engineer at the mine?-- That is correct.

Okay. I am asking you to tell me whether or not there would be dead spots, not that there might have been?-- There is a possibility there would be dead spots, yes.

Can I take you to Exhibit 156? Do you still have that? Now, you have indicated to the Inquiry that what you would look for in terms of spontaneous combustion is a sharp rise in the carbon monoxide levels?-- A jump - a substantial jump in carbon monoxide levels and a sharp trend/rise in litres per minute.

Okay, so a sharp rise in litres per minute?-- That is correct.

Who taught you that?-- That was a product of Mines Rescue training.

Can I take you to page 45 of Exhibit 156? I might add that the reason that I am asking you these questions is not to interrogate you, but we need to get sufficient information when we look at where we go from this Inquiry?-- Yes, I am aware of that, yes.

And there is a lot of things that are important to us?-- I think so too, yes.

In that report and on page 45, which is Mr Highton's report?-- That's correct, yes.

Bill Highton?-- Yes.

He says that a heating can produce as little as 1 ppm in an air quantity of some 20 cubic metres per second?-- Sorry, I am just not -----

Sorry, this is up the top of the page?-- I beg your pardon, yes.

It's about the third and fourth line down?-- Yes.

I mean, does that line up with what you believed your understanding of spontaneous combustion was?-- No, I -----

It doesn't, does it?-- No, not close to it.

You are poles apart?-- Yes.

Where in fact at 512 at the time when there were some significantly higher carbon monoxide make readings, there was velocities, or, sorry, air quantities of around 38 cubic metres?-- 40 - it was designed for 40 cubic metres per second panel.

That's right, so that's somewhat poles apart from some of the understandings that you had?-- Yes.

As a matter of fact, if you go down a few more lines, he makes another comment and says that a small spontaneous heating can be taking place without it being highlighted in the general body of air samples; in other words, may not be detected at all?-- I suppose that's a good note for all Australian coal industries if that's the case.

I think so. I mean, really, you can liken that to somebody standing in the top return taking a Drager reading for carbon monoxide and somebody down in the goaf lighting a match?-- It was -----

You wouldn't detect it, would you?-- No, you wouldn't. It was quite evident a cigarette smoke would, as we showed at No 2, produces in excess of 150 parts just from cigarette smoke. Yeah, it's -----

That's an interesting thing. Now, at the mine then, given your level of understanding about spontaneous combustion, is it likely that anybody else would have known these things? I mean, were there people there that would expect to have more knowledge than you about spontaneous combustion?-- Yes, I do, yes. There were people there.

Okay. Who would they be?-- Well, people like Allan Morieson, Phil Reed and deputies that had experienced the 5 North. One of the good things about Moura No 2 underground is the workforce was more stable than the staff and, therefore, the workforce, if I call it that - the boys had experienced quite a number of different events that had occurred at No 2 and the Moura No 2 underground rescue team had gone to a number of situations and were really a well trained team and well regarded team in the industry.

Okay. So, we have got Allan Morieson and the deputies. Who else?-- Well, Mr Mason was there for a while. Really I came before -----

No, no, sorry, you may have misunderstood. What I am really asking you: who would you expect to have the sort of knowledge that you didn't have, you know, to really understand what spontaneous combustion was all about? Who would you expect to have had that knowledge?-- Well, obviously all the management. I mean, the management would as well as the lads. I mean, you relied fairly heavily on people's experience. Older miners have often - the very good quote, that they have often forgotten what a lot of new people know, and that's very relevant in the coal mining industry.

Whether these deputies were part of the Mines Rescue Brigade -----?-- Most of the deputies - the larger percentage of the deputies - I could not name every single one - but a larger percentage of deputies were all Mines Rescue trained people.

And you would expect them to have a fairly substantial knowledge about spontaneous combustion?-- I would expect them to have - I would have expected an understanding, a practical understanding, and I suppose that's where the parts per million of CO would be involved and maybe either their complacency or, what people say, lack of knowledge would be about.

Would you expect that they should be given updated instruction, you know, ongoing instruction about all the factors associated with spontaneous combustion?-- For sure.

I mean, given that you are working in a mine that's liable to spontaneous combustion and has very high levels of methane -----?-- That's correct.

----- it would be important, wouldn't it?-- Spontaneous combustion is a training prerequisite, so is other things in the industry.

Mr Abrahamse, you have sat through most of this Inquiry. I am not sure that you have sat through all?-- Not through all, but the larger percentage, yes.

Were you present when Mr Graham gave evidence, Len Graham?-- For half of his evidence, yes.

So, would it be fair to say that of all the deputies at the mine, given that Mr Graham has got quite a deal of experience with Mines Rescue and as a deputy, that, you know, he would have a fairly substantial knowledge about carbon monoxide, wouldn't he, and about spontaneous combustion?-- It would have been my assumption, yes.

Well, given that you may not have been here through all of his evidence, he indicated to the Inquiry that whilst he was trained to calculate carbon monoxide make, he really didn't know what it meant?-- I think that's -----

Does that surprise you?-- From listening to the Inquiry, that has been quite prevalent, and it would be very interesting to find out what the industry as such does know. I know that my knowledge also was really limited to the four - the one page in the Mackenzie-Wood book, that is correct. It is an interesting issue that the Court, I think, can address.

As a matter of fact, all of the evidence that's been produced by deputies indicates that there really wasn't a great deal of understanding about spontaneous combustion and what things - what readings meant, some were still parts per million, some understood carbon monoxide make, but -----?-- I was honestly surprised by some of the recollections of some of the deputies, yes.

So, what you are saying is that the people who should have all this understanding and know exactly what to look for with carbon monoxide is the senior management people, because they are the people you would expect to have that understanding?-- They are one group of people that should know, but everybody should be made aware. Maybe that was an issue I had not addressed when Allan and I talked about taking the CO graph out of the mine record book and publishing it. If you publish something like that, then maybe we should have put something more on it. That's something that I will have to live with, yes.

Just go to another point now. You have been asked a question by Mr Clair, I believe, about production bonuses - the payment of a production bonus, and, you know, just how much of an important factor that would be in people's minds when they go to work?-- Yes, he did ask me that question.

I just want some clarification, that's all. Is it suggested or would you believe that people would put themselves in a dangerous situation with the bonus factor in the back of their minds? In other words, "I'll take a risk because I might get a few more dollars." Is this a reality, or is it something that you have experienced, seen or believed or heard, or what?-- As a miner myself, I know I did things that weren't absolutely desirable, and that's not hiding any facts. It is human nature-----

I appreciate your honesty?-- People will do some things, whether they feel comfortable, whether they feel who dares wins or I can dare this, but there would be others who would not take those type of risks. You are dealing with human nature here. I mean, like I said, at one stage I would go through and pull props out of goafs.

I mean, would there be any suggestion that people would put their life in danger, knowing that there is a risk?-- The human instinct of that is people wouldn't want to put their own life in danger, but people run risks. You run risks going to work every day of the week.

That's a fact of life?-- That's a fact of life, that's right, and people can become complacent in the environment they work within five days a week, but that's a very real thing, too; you become complacent.

Just touching on another point, did you view the video?-- Yes, I did.

Can I ask you, from a mining engineer's point of view, and bearing in mind - let me ask you this question first: did you or did you not go into 512 after the sealing had taken place - before the incident?-- I was underground in 512 on the Thursday before sealing.

So, you didn't actually visibly see the seals after they had been re-erected?-- No, I did not.

But you would obviously know what a seal looked like?-- That

is correct, yes.

Well, having viewed the video, can you tell me - or tell the Inquiry what conclusions you drew?-- The only conclusions I could really draw was the fact that the seals were not there - that is, both the 512 and the 511 - and that is all that you could really gain from that footage.

You didn't see any remains-----?-- Yes, I did.

-----of sealing. And in relation to where the seal was erected, where were the remains?-- Those remains could have been material that was left on site and could have been blown anywhere. The fact that - the quality of the picture was that poor, I don't think that it was good enough information or good enough footage to be able to say exactly whether that material was inbye or outbye of the seals. That's my opinion.

Well, that's all I asked you. You said in answer to another question that when asked about your concerns of spontaneous combustion, that spontaneous combustion was always in the back of your head. I mean-----?-- It was Moura No 2 underground, yes.

Do you see that that is probably one of the associated problems - that spontaneous combustion and the effects and the dangers associated with it may be in the back of people's heads where it should be in the front of people's heads - it should be treated with more priority - higher regard placed on it?-- In hindsight, yes, it should be treated with a lot more regard.

I want to take you to the now infamous reading that has been described as right or wrong or indifferent, or whatever - the 8 ppm reading. Just a concern that I have in one of the answers that you gave: you did describe it as being proved wrong?-- With the facts using the Unor system, I thought it was wrong, yes, and we - Dave Kerr, Reece Robertson - we all sort of inferred that yeah, it was wrong.

Okay. Well, with what you now know, what you have learnt by sitting in on this Inquiry, would you still say it was wrong, or is there a possibility that that was, in fact, a correct reading?-- The only way it would have been a correct reading is if it subscribed to Mr Clair's theory of a plug, and I can't - I cannot comment 100 per cent on that.

Well, plug or whatever, is it not a fact that in circumstances such as you had created in 512 for the goaf, similar to what we have, or had, and the manner in which it was being ventilated, that it would be natural to get what I would call wafting?-- I can't comment on that. I don't know about wafting - what you would term wafting as.

We are different generations, you see?-- That's right, yes.

Well, you can get outrushes, if you like?-- Plugs.

Or plugs, yeah, okay, coming in and out. I mean, isn't

that-----?-- Yes-----

Would you not expect that to occur?-- I have heard of instances where, say, plugs of methane have travelled and have been registered on the Unor, then obviously they die away. So, you would get a higher reading and then go back - the next reading would be a low reading. He would just assume that yes, there was a high concentration that flowed through. I'm not saying that plugs don't occur. They do - they do occur, but how you can analyse it, I'm just not too sure. Maybe it is a SIMTARS question, I don't know.

Yes, but, you are a mining engineer?-- I am a mining engineer, that's correct.

You understand what "convection currents" means?-- Yes.

Would you expect to have a certain degree of convection in a goaf such as 512?-- Obviously with-----

I said "a certain degree", I'm not talking about a complete circuit?-- Yeah, goafs are a different breed, aren't they?

We know we have got two different temperatures, don't we? We know we have got different temperatures of cooler intake air and warmer goaf atmosphere?-- Yes, the temperatures of intake air to goaf air would be different and the return air would be fairly similar, yes, to the - to the - or middle between the intake and return, because it is all coming into one. You have increased the velocity and that has a cooling effect. There's-----

Which would create turbulence of some description?-- Yeah, mine ventilation creates turbulence. Sorry, I'm losing the plot here.

Okay. What I'm really getting at is that the 8 ppm reading could have been a correct reading due to a lot of unknown factors, that being one of them?-- It could have been a wrong reading but-----

No, I said it could have been a correct reading?-- It could have been a wrong reading, too. Sorry - I can't subscribe to both. It is either one or the other, isn't it? The reason why I don't think it is correct is because it wasn't brought up on the Unor.

When was it that you learnt that the sealing was brought forward due to the indication of a smell and a haze?-- I was not aware that it was brought forward at all.

Until after?-- I arrived at work knowing that there was an explosion in the underground. It was only some time later that I had found out that there was a - that they had sealed the 512 section.

Can I take you to Exhibit 152?-- Yes, I've got it here.

Have you?-- Yes, thank you.

I think you were asked something by Mr Harrison - or maybe Mr Clair, actually - about what you would derive from the readings on the 1st, 2nd and 3rd of August. The question was in relation to the higher readings on the 1st, and you indicated that whilst they would be of some concern, that there wasn't really a concern because on the following two days the readings were lower?-- Looking at - no, that was looking at this information, yes.

Yes. I appreciate this is all in hindsight?-- Yes.

Can you explain to me why you would have said that, you know, because the next two days were lower readings that there wouldn't have been a concern on the 1st?-- Well, I don't quite know what actually happened on the night shift and the day shift - whether that was maintenance or whether there was machinery in the area, or a regulator had been closed somewhere else. You know, there is those reasons, and I suppose that's why that weekly average was introduced because of possible anomalies like that that could make the difference, and obviously those readings were then part of the week's average towards the end - on the Friday, you know - but it could have subscribed to the plug that Mr Clair suggests, but then also you have got to look at the picture in context, don't you? You have got to look at the whole picture and analyse each one of those, but also understanding what happened underground, and that's the difficult thing. Like I said, an improvement in the FP700-010 is that maybe a comments table needed to be there, so that we would be able to understand exactly why certain readings were obtained.

When you analyse these sort of circumstances that we are talking about and you have just described, do you look for the worst case scenario, or the best case scenario?-- I don't know. You always look for the worst case scenario. There is the 22nd of the 7th. I mean, I put the 8 parts in there to calculate the worst case scenario for that particular reading. I mean, these are just evaluating ideas that have been thrown up in Court now. I mean, in hindsight it's very easy.

But just following on from that now, if you believe, and you have just told me that you always look for the worst case scenario - I mean it was evident, wasn't it, that there was something unusual happening at the mine in 512, and for some time - for quite a period of time?-- There were anomalies.

There were signs that something could have been happening?-- Early on in the peace - like I said, smells - there was something.

Okay. Now, if you were of the inclination that, okay, something might be happening - let's assume the worst case scenario that you said you would do - why is it that the - first of all, the chromatograph was not introduced, or put into use? Why is it that the probeye - the piece of equipment that was readily available at the mine - was not used? Can you tell me that?-- No, I can't. I can't tell you that, no.

Well, then, surely it may not be correct when you say that the worst case scenario was developed or thought of? I mean, wouldn't you do that? I mean, if there were signs that something could have been happening and you had pieces of equipment - sophisticated equipment at the mine - wouldn't you go to it and use it?-- Yes, we should have - in hindsight, we should have used it.

Well, hindsight or otherwise, I mean, it was all there, wasn't it?-- The chromatograph was there and the probeye was there.

But, I mean, the use of the chromatograph would have given you a very quick indication of what you had in the atmosphere in 512?-- It would have given us an indication if there were hydrogen or hydrocarbons.

Exactly. What would that have told you?-- That there was a possible heating.

Now, in hindsight - in hindsight - with all of the things that have been detected - and, I mean, Mr Parkin ran you through those and Mr Clair did - things that are contained in Mr Highton's report, which makes it very simple to follow because it is all in chronological form with all the detections of smell, haze, increases in carbon monoxide make - I mean, all of those things were there; people knew that these things had happened. The gas chromatograph at the mine, a probeye, none of that was used. Let me ask you a question: what degree or what quality or what - however you describe it - do you believe this occurrence was treated by management and other people as well at the mine prior to the incident?-- With a bit of complacency, if you can call it that.

With a bit of complacency?-- Yes, everybody was complacent. They seemed to be comfortable for a whole lot of reasons, whether it be parts or make, or-----

But, you know, given all those factors - I mean, a bit of complacency? I find that hard to - I mean, we are looking back in hindsight now - I realise what you say - it is a question in hindsight?-- I mean, people experience - people were on the seals on the weekend and saw those things, and yet they were - that is the frustrating part; they were, too, complacent with seeing hazes and if they reported smells.

I am not trying to pin down individuals, I am talking about-----?-- No, it is frustrating for me, too.

There is a whole lot of people involved in this process?-- That's correct.

Would you describe it as somewhat negligent on behalf of people?-- No, "negligent" is a very hard term in the courts. People were complacent with the parts, most probably, that they were looking at, and maybe their history where when they did seal 5 North, were putting the last brick seal into place at 150 parts as the report suggests. So the comparison in absolute terms, I know it doesn't make sense, but maybe people were comfortable with what they were in before the 10 mark, you know. I don't know. So that's why I say "complacent" rather than "negligent".

So what you are saying is that with all of the information that we now know, the fact that alarms were running and nobody attended to them, or alarms didn't ring because they were turned off or whatever, and we have got a suspected situation in the mine where there is a possible heating, we have a situation where everybody knows the atmosphere is going to go through an explosive range, and we have sophisticated equipment that could have answered the question very quickly and very easily and wasn't used and you are telling me that that's just a bit complacent?-- People were complacent - once the seals, obviously, were erected they thought the problem was behind them. That's the only - that's my opinion again.

Are you satisfied that the thing was dealt with properly?-- In hindsight or -----

Yeah, in hindsight?-- In hindsight obviously not. I mean they were friends of mine that were underground as well.

I understand that, I understand that. Thank you.

EXAMINATION:

PROF ROXBOROUGH: Mr Abrahamse, you graduated in 1987; did your mining experience started in 1984? Is that right? I think that's what you gave us in evidence, graduated in 1987 but your experience started in 1984?-- Sorry, my mining experience?

Yes, yes, because you had -----?-- End of '83/'84. My first place was Newcastle, yes, that's right.

Apart from the two to three year gap following Invincible you've been in mining all the time?-- In some type of mining operation, yes.

So in addition to your degree you have around about eight years mining experience?-- From taking the degree in '82 up, yes.

Would it be true to say that the University of Wollongong course in mining engineering tends to specialise in coal mining, not to the exclusion of metalliferous mining, but with a greater emphasis on coal mining?-- At the stage I was at

the University, yes, it did.

Is it true that the mining course was operated by the Department of Civil Engineering at the University of Wollongong when you were there?-- It was a civil and mining department. We did a lot of courses together, but there was a specific department that Dr Aziz was -----

Dr Aziz was on staff at that time, was he?-- That is correct, yes.

How many full-time mining engineers were there on staff at the University?-- Lecturers specifically?

Full-time appointments at the University in mining engineering?-- I know specifically of Dr Baffi, there was a Dr Porter, Dr Aziz, Professor Upfold, I think, was a civil and mining engineer.

The course involved lecturers from the local coal mining industry?-- Yes, on one occasion there was a gentleman from Westcliff that came and gave a six week talk to us, yes - or lecture, sorry.

You probably had more mining visits given your proximity to the local coal industry than other university courses?-- That's correct, yes. Dr Aziz was quite strict on that, to get ourselves out and about even on the weekends, yes.

Possibly in preference to on-campus laboratory work?-- Sorry?

In preference to or as an alternative to on-campus laboratory work?-- As an extra.

Is that what you were referring to when you told Mr Clair in evidence that Wollongong provided a very practical course?-- That's right, yes.

You would say that the course was stronger on mining practise and current mining technology than on theory and scientific principle?-- There was a mixture of both, but we had a lot of part-time students and they contributed quite significantly to lectures as such.

You said that you got no specific instruction at Wollongong on spontaneous combustion and no specific reference to Graham's Ratio?-- Not that I can remember, no.

Was it perhaps that you had been told the significance of the carbon monoxide/oxygen deficiency ratio without necessarily knowing that it was called the Graham's Ratio? Is that a possibility?-- That is a very strong possibility. Until you put things in context they don't sink in.

Yesterday you told Mr Martin that you had passed the written examination for your undermanager's certificate?-- That is correct, yes.

Does that mean that you now have your undermanager's

certificate?-- No, not as yet.

You don't?-- I have completed my oral and I'm just waiting

You don't have the results yet?-- I do not have the results - beg your pardon, I do have the results of my oral. I have passed my oral. I had to submit a paper on three questions, one on the open-cut and two aspects of underground mining, and I have not received word back from that yet.

When did you sit the examination?-- The oral?

Well, are you part of the 1994 group of candidates or has it been spread over a little longer time than that?-- June I sat for the written. It was November I sat for my oral, and then subsequently - or was it - I can find an exact date.

No, it's not important. When you sat the examination were you asked any questions on spontaneous combustion?-- Yes, I was.

Your position at Moura as mining engineer is not a statutory position, is it?-- That is correct.

You were a mining engineer, not the mining engineer, in fact there are several mining engineers at Moura?-- There are several mining engineers, that's correct.

It's generally true, is it not, that most mining engineers in the coal industry operate in such positions as mine managers, undermanagers, mines inspectors and so on?-- That is the way the industry is developing, yes.

There is no statutory position known as mining engineer, is that true?-- No, not in the Coal Mining Act, no. The open-cut have officials as such and, you know - I don't know if it's a statutory qualification, but they run official courses.

We have heard about your many and varied responsibilities at Moura; did you have any authority at Moura? Were you in a position where you were empowered to give instructions and have them carried out?-- I did with regards the gas drainage. I didn't employ - and then project work like the overcasts or tank building, but not with regards organising men to go mine coal.

I think you've said that your immediate supervisor was Mr Schaus, the mine manager?-- That is correct, yes.

Now, you were involved in the design of panel 512?-- That is correct.

I think you've told the Inquiry that your undergraduate thesis was on the stability of longwall gate roads?-- Case study, yes.

Which I think you likened to a bord and pillar development operation. The development work for longwall panels, I think you said in evidence, was much the same as development work in

bord and pillar. In other words, continuous miners, shuttle cars -----?-- I had obviously - no, what I made reference to was I worked in the Main Dip section which was a five heading system which is similar to a bord and pillar operation system.

But at Newvale too you worked on bord and pillar?-- That is correct, yes.

Did that involve pillar extraction?-- For a short time, yes, it did.

So I imagine you had a good grounding in strata control at Wollongong University?-- Yes, I did. I understood - they gave you tools, yes.

What I'm trying to get at is you had something to offer in respect of the design of 512?-- Yes, yes, I did.

You referred to work by Carl Pritchard on calculating safety factors on remnant pillars?-- That's correct, yes.

You were aware of that; were you involved in that work?-- No, he had collated a report on that before I had got there and I carried that work on.

You carried that work on, and I think you mentioned that you had used empirical formula to back analyse pillar performance?-- Yes, I had extensive discussions with Bernard Madden and Jim Galvin with regard those.

What empirical formula were used?-- The criterior before I arrived was at less than the 200 metres depth of cover. They talked about the Salamond's Formula, the straight Salamond's Formula. Carl said on his back analysis the Wilson Formula which were chain pillar designed formulas where - seemed to be a better criterior for Moura, and when Bernard Madden arrived on the scene he introduced the modified Salamond's to the Squat Formula that he had developed in South Africa.

Was this investigation used in any way in the design of 512?-- Yes, it was.

Did the design of 512 expect the remnant pillars - I think you referred to them as fenders or stooks - were they expected to crush?-- They were not expected to carry any load, no. In the model that Bernard - like I said, once we moved away from regular remnant pillars it was out of my league then to physically design an overall panel. He said that in his model the remnant pillars were designed not to carry any load.

I think you've said that when you first joined Moura that the mine and its personnel were palpably conscious of the mine being what you might called a spontaneous combustion mine?-- That is correct, yes.

So there was an awareness and a feeling throughout the mine that this was a problem that the mine carried?-- It was a problem, yes, an occurrence.

But the design of 512 didn't take account of possible spontaneous combustion problems?-- No, it did not, no.

And it was related exclusively to mining systems, method of working and strata control?-- That is correct, yes.

I think you've said that the design of 512 was intended to keep the goaf open?-- That is correct, yes.

And you were aware in the design of the importance of pillar height being a dominant factor in respect of stability pillar height?-- Pillar width.

Pillar height?-- Yes, analysing your width to height ratio.

Was the factor of safety for panel 512 ever calculated?-- For all the options or for that particular -----

For that particular design?-- Bernard Madden would have - I had not seen any information about specific safety factors other than the fact that the larger compartmental pillars were sufficient enough to bridge the load. He had used the Voussoir Arch theory to calculate the panel stability.

You mentioned that there was some strata control monitoring being undertaken in 512?-- Extensive strata control monitoring.

It was in two parts, was it? There was the part relating specifically to the design of this pillar, and I think you mentioned there was an ACARP project on high mining -----?-- Thick seam mining, that is correct, yes.

Were the two programs integrated?-- They were integrated for share of information because the ACARP funding was granted to ACIRL. Russell Frith was in charge of that who had - who was in communication with Bernard in Wollongong.

All in all this panel was getting a lot of attention from a lot of experts. You had the involvement of quite a few people?-- That's correct, yes.

In respect of the 512 were any surface subsidence measurements proposed?-- No, they were not proposed, no.

I mean given the design and behaviour of this panel was an unknown quantity, it was a new design?-- We had used that type of extraction in the 401, 402 and had not identified any surface subsidence.

The barrier pillars?-- The 401, 402 panel, yes. It was one of the criterior that was put forward to Bernard Madden and that's - why we were a partial extraction system was that we did not want to cave 2C seam.

But it is a fact, is it not, that panel 512 was an experimental panel, trying new systems?-- We had tried the new system in 401 and 402 and implemented that monitoring data to the 512.

Did any persons knowledgeable in the field of strata control to your knowledge visit 512 prior to the explosion and express concerns over its design and its stability?-- To the contrary, they were quite surprised of the regional stability of the panel.

So those people knowledgeable in the field who visited the mine expressed -----?-- They said the panel worked excessively well, yes. That is evident in the photographs that Bernard Madden and David Hill took in that panel.

You said yesterday that Carl Pritchard had put forward a proposal to use breaker line supports?-- Yes, he did, yes.

This implies caving the goaf?-- No, not caving. Moura had the ability - Moura sandstone had the ability to expand quite significantly. I think if you make reference to the first map that was produced by Mr Morrison you see that the breaker line supports were going to enable us to strip the left and the right-hand side of a heading. That was the difference. Opening up that span - if you opened up a span as wide as that you would require some sort of passive support while your men were in that area.

Okay. You mention in evidence that the law requires barrier pillars of four to five metres?-- The Coal Mine Act states so as to not mine towards a potential inrush.

I notice several of the designs for 512, the exercises that you were going through which are summarised in Exhibit 157 -----?-- That is correct, yes.

Do you have that in front of you, 157?-- No, I don't.

Could the witness be shown 157? Several of the design proposals in 157 actually are using a barrier pillar only 37 metres wide?-- Yes.

Can you explain that? Would you describe that as a contravention?-- No, it's not a contravention to the rules. I suppose it's one of these grey areas again that you can speak of. The 5 South Panel that was adjacent to it was a ventilated panel and we therefore were not mining towards a potential inrush. What it did mean was once we were going to extract the 5 South panel, that we could not mine towards the 512 Panel and the - that was the reason for the instrumentation in that barrier pillar, to understand what sort of effects we were - what sort of stresses we were loading the barrier pillar with and whether they were competent enough, and the 37 metres was a fixed parameter that was just inherent in that location.

But that pillar becomes the barrier pillar for 5 South?-- That is correct, yes.

And it's undersize according to the law?-- According to the law it is - you would not mine towards the potential inrush.

160295 D.27 Turn 11 dfc (Warden's Crt)

What size is the existing pillar between 512 and 5 South? 37 metres?-- 37 metres.

I think some of these diagrams suggest to me - perhaps you can

clarify it for me - that it was intended to rib strip the barrier pillar with 511 in the bottom return?-- That is correct, yes.

Was that in fact done in 512?-- It was, yes.

So, you are in fact reducing the barrier pillar?-- We reduced the barrier pillar to 45 metres.

You reduced to 45, you didn't start at 45?-- No. One of the limitations I described the other day was it required the 45 metres plus seven metres of rib strip plus four and a half metres to go to the middle of that bottom return.

One of your main areas of responsibility was gas drainage. Can you tell us how do you know when you have pre-drained an area sufficiently to allow mining to proceed?-- Yes, there were two systems that we had in place up until that time. The first system, as I said yesterday, was the 5 South when we physically dropped each - there were nine holes across the face. We would physically drop one hole off at a time in the natural ventilation to find out what concentrations we were getting at the monitoring points. That is one method. That would be the crudest method. The second method that we did employ in the 510 extension and the 520 panel -----

I know 520?-- ----- is prior to drilling we would determine the in situ gas content, determine the block of coal that we were going to drill and drain. We would ultimately on a weekly basis, once the block was drilled, measure the gas flows and do a basic subtraction using Ray Williams' Geogas software and determine a residual in situ content. That in situ content that you would calculate was then cross-examined, if you can call it that, with a borehole that was placed into the panel and an in situ bomb taken of that degassed block. We were in the throes of getting that model again. The Geogas software was a model to - correlating the system that we were using with the bomb that we would take after a certain period of time we left the panel degassed.

Was it possible that 512 Panel was started before the area had been fully degassed?-- No, to the contrary. The 512 Panel had been degassed - I can find out an exact date. The inspectors have documents stating the length of time that each area was degassed, but it was a considerable period of time.

Okay. However, the drainage system for 520 comes very close to 512?-- That is correct.

And you were draining while 512 was being worked?-- That is correct, yes.

And were taking something over 5,000 cubic metres a day from 520 while you were operating in 512?-- That is correct, yes. Moura had one great benefit with regards gas drainage, and the fact was the seam was very permeable. We could effectively go 20 metres beyond the end of any borehole, and that was a proven test - proven test - consistently proven test, but once

you went to that 20 metres, you hit a solid wall of methane gas again, so the permeability of the seam was very good, was excellent.

In other words, the gas flowed readily through the seam?-- And, therefore, that's why we did not require - at that stage we did not require suction on the lines to remove the gas.

The gas was under pressure, natural pressure?-- It was under natural pressure, yes.

You said that goafs at Moura quickly fill up to 98 per cent methane?-- The 511 goaf, given that it was surrounded by three blocks of solid coal and two of those blocks had not been degassed, filled up very quickly with methane, yes.

Would you agree that one of the main sources of gas into 512 after sealing would be into 13 cross-cut from the 520 area?-- No.

Well, you just said that the coal is very permeable?-- That is correct.

There is obviously a lot of gas still being drained from 520?-- That is correct, yes.

You had degassed to the north. 511 will presumably be full of gas but not at an extraordinarily higher pressure than atmospheric. So, you would say that the preponderance of gas in the seam with a potential to move into 512 would be that area that is being degassed from 520?-- That area - the gas concentrations in 520 had dropped quite significantly but not yet sufficient for us to physically mine.

When you say had dropped, had dropped where?-- Had dropped to - from between 12 to 15 in situ content had dropped to about 3 cubic metres a tonne in situ.

At what stage had it dropped to that level?-- Just before the explosion.

Yes, but we are talking about a situation where the panel was developed in - what is it, February?-- In February, yes.

So, there -----?-- February/March.

So, there is quite a large reservoir of gas in that area during the operation of 512 in the 520 area?-- There was still - there is still a large quantity of gas, yes. The distance between that particular hole - the hole in 520 and the end of the 512 Panel left - was a sufficient barrier. It was - I don't know the actual dimension, but I can find out for you.

Would you agree that after sealing it's more likely that the panel would fill with methane from the back of the panel, would start filling at the back of the panel? It would fill from the back rather than -----?-- Yes, I would agree with that, or from the adjacent panel, yes.

Would you agree also that the source of heating, if there was a source of heating, was more likely to be towards the back of the panel than the front of the panel? By the front of the panel I am talking about adjacent to 510 towards the seals. So, there would be a greater tendency, would there not, if there was a heating in 512, for it to be towards the back of the panel?-- That's a possibility.

Is it not a thing that one can reasonably, on the basis of the coal has been exposed longer in that area -----?-- Yes, on that assumption.

On that basis?-- On that basis.

It's more likely -----?-- The smells -----

And I would maintain also the possibility of crush on some of those remnant pillars, irrespective of what the expectations were, that the balance of probabilities is that there would be more likely a heating deep into the panel rather than -----?-- Rather than outbye of the panel.

Would you agree with that?-- There is a good possibility, yes.

So, the sampling point to monitor the atmosphere in 512 after sealing was probably in the least useful location for sampling the atmosphere and for indicating possibly when the panel was going through the explosive range or would reach the explosive range. There could have been an explosive range deep in the panel well before it had been indicated at the sampling point near the seal?-- There is a possibility of that, yes.

I would suggest perhaps more than a possibility, that that's the more likely scenario. Could you say why the Tecrete seals were used in 512 in preference to brick stoppings? This was the first time they were being used, isn't it?-- As a permanent stopping, yes.

As a permanent stopping?-- The entire structural integrity of that type of system was far superior to normal bricks and mortar. Your bricks - your weakest point in your bricks and mortar is the physical mortar itself. By trying to introduce a homogeneous cementatious product that had a strength of 60 mPa, it seemed a far superior idea and a far superior method, including the fact that we were putting roof bolts as reinforcement from roof to floor and from rib to rib.

Mr Martin yesterday raised a question of curing time with regard to the Tecrete stopping, which I think we recognise as an important factor, but would it be fair to say that you were, because of the urgency, the fact that the sealing had been brought forward, you were committed to using Tecrete at that time?-- You could have used blocks if you wanted to.

Did you have time to erect a brick stopping given the fact that the sealing had been brought forward, or were you effectively locked into using Tecrete given the

circumstances?-- No, you are never locked into using Tecrete, but as part of your Part 60 you require all your material on site so you can do work, so all that was needed was the gentlemen, the two gentlemen, from Tecrete that were there to train all the personnel on site. We had hired two batchers so that you could do the job jointly. It just was the obvious choice to erect your prep seals with the Tecrete mesh blocks and grout. You could have if you had taken cement and mortar, but it would have meant a little bit more, you know, preparatory work.

How long would it have taken to change from at the time of putting up a Tecrete to putting up a brick stopping? How long would it take to organise it, re-organise it?-- The longer part of that time period would be the actual supplying of material from the surface to the location of the prep seal. That would be the larger proportion of your time.

Several hours?-- There would be about two shifts for the three stoppings that you bring material in, but that could vary too. You would have both Eimcos running at the time with MPV's. If you mass all that equipment to setting up one task with personnel, it could have been done on one shift. It's very dependent on what you used and how you used it.

Okay, thank you.

EXAMINATION:

MR ELLICOTT: Did you at Moura No 2 have analyses performed of the various seam gases that were in the environment there? Did you have, for instance, an analysis of the content of the D seam?-- Of the D seam itself - Phil Draheim, the geologist, would have conducted those. I can't say that I was aware of them other than the fact of analysing ash content.

No, I mean the gas itself?-- Methane, I think, was the only sample that he was taking at that time. I don't think any others were -----

Should those analyses be available in documented form somewhere?-- From a technical point of view I think a lot of good strata information and coal information - the more the merrier, so to speak, yes.

The thing I am particularly interested in is whether there was any carbon dioxide as a seam gas at Moura. Can you tell me that?-- The only reason I know that - with regards seam analysing with regards to gases, the methane that we produced was of a 99 per cent purity and those samples I know Phil Draheim did take, but I can't give you a location of where-----

That doesn't leave much room for carbon dioxide, does it?-- No, it doesn't at all, no.

So, the D seam was the drained seam?-- That's correct, yes.

Do you have any knowledge of the C seam?-- No, I do not, no.

You have indicated that some time after 22 July you made a call in Sydney to Albert Schaus?-- That is correct, yes.

During the content of that call you suggested the sealing of the bottom return; is that true?-- I said to - not to seal it, just to close it.

To close it?-- And basically not use it and turn - and possibly turn that into an intake so that we wouldn't use it as a return heading, yes.

What was the problem you were seeking or suggesting a solution to in relation to that?-- Just the fact that we would not have people altering ventilation on the bottom, it would be - once it was established, then you wouldn't have to worry about it any more.

Had there been a problem of people altering ventilation in the bottom?-- There were a number of occasions when you would have deputies that would alter regulators, like deputies and a drainage crew that would make alterations and maybe not report them until - and people would find out about them later on.

May some deputies try to seek a bit more air over the miner from time to time when they were down the bottom of the panel?-- There is a possibility that they could have been doing that, yes.

Do you still have Exhibit 161? You will note the comment in the bottom left-hand corner of that exhibit which says it's for purposes of illustration only?-- That is correct, yes.

Would you agree, given the content of that diagram, that both the Drager and the Maihak have produced what you might call a correct result given those circumstances?-- Given all those circumstances, yes.

Now, would you agree that these events may shift in time and that the results obtained would depend on the relative timing of events shown there?-- The relative location of the plug.

Well, of that plug or other plugs?-- Or other plugs, that is correct, yes.

When a Drager reading was taken or wasn't taken, when the Maihak sample was taken or not taken?-- The only consistent thing would be your Maihak sample every 13 minutes, I think.

The other things could shift in relation to each other?-- That is correct, yes.

Now, this particular instance shows a Drager reading being obtained that appears greater than the Unor reading?-- That is correct, yes.

Could not the inverse be probably equally true, that you may in fact get Unor readings that may be greater than Drager readings?-- That is correct, yes.

That's all, thank you?-- Thank you very much.

MR CLAIR: Your Worship, there is just one matter that I wanted to deal with before the break. It involves a document. It will give people an opportunity to read it during the break.

WARDEN: Thank you.

FURTHER RE-EXAMINATION:

MR CLAIR: Mr Abrahamse, I will just ask you to look at this document here. I have copies for the panel and for the parties, Your Worship. Just while the witness is looking at that, I will mention, Your Worship, that this is a document that was provided by the mine to the Inspectorate along with a whole body of documentation, but I couldn't say now as to which, if any, of the documents in Exhibit 9 it comes from. There was mention of Jim Galvin - I think you mentioned that name -----?-- That is correct, yes.

----- in answer to Professor Roxborough. That's professor J M Galvin of the University of New South Wales; is that right?-- That is correct, yes.

Did he visit the mine at some stage with a view to looking at the design of that 512 Panel?-- Yes, he did, yes.

It seems from this document that he subsequently wrote to Mr Schaus at the mine?-- That is correct, yes.

Was that letter drawn to your attention at any time?-- It was, yes.

Now, just briefly, there was some items that he mentioned as three critical issues affecting the safety and efficiency of operations on the bottom of the first page there?-- That is correct, yes.

And then there were a number of questions which he raised for consideration. They are set out on the second page; is that right?-- That is correct, yes.

One of those in particular, the last of those questions for consideration, was this: "Has consideration been given to undertaking a formalised risk assessment to address the preceding issues and others associated with the underground environment at Moura Colliery?"?-- Yes, I see that. That is correct, yes.

Now, there has been mention of a risk assessment. Was that a risk assessment on 512 Panel design?-- It was on the 512 Panel system of operation and what to be aware of underground. More because we were of this system of take a row, leave a row, Bernard Madden was - he was concerned about the localised roof falls that could still kill people, and, therefore, by making deputies and miners more aware of the localised structure, being able to identify them, that would be - that would make them a lot safer obviously. He wasn't questioning the regional stability of the whole panel.

Was there any risk assessment done with a view to addressing the issues that were raised - or were raised by Professor Galvin in this letter, do you know?-- I think some of the these points-----

You can if you wish-----?-- Yes, some of those points were addressed - some of them were addressed in the risk assessment that Bernard Madden was part of. He was one of the contributors to that risk assessment.

Perhaps I can ask you this way: was the risk assessment that was done something which, to any extent, was in response to any of these matters raised by Professor Galvin? Do you know that, or are you-----?-- No, I can't answer that, sorry.

Well, I perhaps can leave that question for Mr Schaus, to whom the letter is addressed, but since the matter was raised with you, I wanted you to have a look at the letter. You might, if you wish, look at the letter at your leisure. I know it is hard to read it in the box, so look at it over the break and if you have any further thoughts about it, you can mention those when you return?-- Thank you.

Thank you. That's an appropriate point, Your Worship. Your Worship, I will tender that letter. I don't know that I did. I tender it at this stage.

MR MORRISON: With that could document 110 - I think it is B - of the inspector's documents go with it. That's the Senior Inspector of Coal Mines response to that letter, also directed to Mr Schaus.

WARDEN: You want to mark that 110B?

MR MORRISON: Sorry, it is document 110B in the inspectorate document. If it could be extracted?

MR CLAIR: It might be appropriate to make this document 110C, just to keep it associated with that report, thank you, Your Worship.

WARDEN: Thank you. It will be marked 110C.

ADMITTED AND MARKED "EXHIBIT 110C"

WARDEN: Can we take the lunch adjournment, and bearing in mind our early finish this afternoon, can we resume at 2.15 sharp?

THE COURT ADJOURNED AT 1.03 P.M. TILL 2.15 P.M.

THE COURT RESUMED AT 2.15 P.M.

JACQUES FRANCOIS ABRAHAMSE, CONTINUING:

MR NEILSON: I would like to just tidy a certain issue up before anybody starts.

MR CLAIR: Can I indicate, Your Worship, I don't have any further questions. I really just wanted to correct something that occurred immediately before the lunch break. It might be best if I do that now, simply to get the exhibit marking corrected, Your Worship. I understood - or misunderstood what Mr Morrison was saying. I thought he was suggesting that there was a relevant document, which was Exhibit 110B, I understood him to say at the time; in fact, he was referring to document 110B, and I've mistakenly suggested that that last document that went in then be marked Exhibit 110C, which would make no sense at all, so it should be given its normal exhibit marking in the run of things, which I think, Your Worship, would be Exhibit 162, and then the document that Mr Morrison was referring to has been isolated - in fact, it is document 110C from the bulk of documents in Exhibit 9 and I'll tender that as the next exhibit, which would make that Exhibit 163.

WARDEN: Thank you. Marked Exhibit 162 and 163 as you have indicated.

ADMITTED AND MARKED "EXHIBIT 162"

ADMITTED AND MARKED "EXHIBIT 163"

MR CLAIR: Exhibit 163, for a description on the record, is a letter from Mr Schaus to Mr Walker, Inspector of Coal Mines, referring, in turn, to Professor Galvin's letter, that's Exhibit 162. Thank you, Your Worship, I have copies of that Exhibit 163 for the panel and the parties. Thank you, Your Worship.

MR NEILSON: Yes, for the benefit of the Inquiry, just prior to the lunch break I asked Mr Abrahamse a question in relation to the manner in which the problem at Moura No 2 Mine prior to the incident was dealt with. Mr Abrahamse indicated that it was probably dealt with on the basis of some complacency. Not being satisfied that that was the level at which it probably did occur, I then suggested the word that maybe there was some negligence. I want to retract that. I want to retract it for a number of reasons: (1) that it has become obvious to me that some individuals have taken offence at that. It was not meant

at any individuals. As a matter of fact, I asked the question in the context of the way the problem was managed by a whole range of people, not any one individual person. The other thing is the word "negligent" wasn't really consistent with my question, and I don't think it is appropriate for the panel members to be seen to be suggesting negligence. That's not what we are here for. I mean, if that is a result for another jurisdiction, well, that's fine. That's not our purpose. The word was incorrect. It was inappropriate for me to use it. I apologise to the Inquiry, I apologise to any individuals that may have taken offence from it. I would also respectfully ask the media people here to make absolutely no reference to the fact that I, first of all, used the word, or secondly, that I've now retracted it. I would ask you to show due respect in that regard. Having said all that, I would now like to re-ask the question of Mr Abrahamse, unless there is some objection?

FURTHER EXAMINATION:

MR NEILSON: Mr Abrahamse, I won't go through all the detail; I think you are well aware of what I was alluding to - that all of the indications that were there and all of the equipment was available and the known fact that the atmosphere would be passing through the explosive range, I guess - and my question to you then is: do you think that the overall management of the problem could have been done in a far more appropriate way in hindsight?-- Obviously in hindsight there were a lot of things that should have been and could have been addressed, yes.

Thank you.

CROSS-EXAMINATION:

MR MORRISON: Mr Abrahamse, I just want to ask you a few questions. I know people have said that to you before, and let me just fall in line - it is just a few questions. I want you to know that you now hold the record at the Inquiry for appearances at the Inquiry, beating Mr Morieson - that is, the present record. You were asked some questions about the view that you held back on 22 July 1994, namely that the method of mining was an explanation for the high CO make levels or the higher CO make levels than other panels had experienced; do you recall those questions?-- Yes, I do, yes.

It was suggested to you that there may be some doubt about that as a theory, or that it had been doubted by Mr Highton in his report?-- From his report, yes.

But it is a fact, isn't it, that it is the view you held at the time on the facts that you had?-- The facts that I had,

yes.

And as you understood it, Mr Kerr held the same view?-- That type of mining system could be - yes.

We have heard, it seems, that Mr Mackenzie-Wood might have had a similar view based on the facts that they then knew?-- Based on from listening to the Inquiry, yes.

Now, you were also asked questions about why you hadn't approached, for instance, SIMTARS or Mr Kerr or New South Wales experts, whoever they may have been - I don't think we were told - and you were asked why you didn't approach them or to comment on the fact that you could have. Do you recall those questions?-- I do, yes.

If you had approached them, what was the extent of any data you could have provided to them for the purpose of their analysis?-- The only realistic data would be the sections of 511, 403, 401, 402. At that stage, that's the data that I had. That's all I could give - and then obviously the 512 and then the ventilation surveys.

And you mentioned that you were embarking upon the process of establishing background make?-- That's right. The first case was the 512 panel where we were embarking on such an idea, yes.

In respect of that category of information, you didn't have very much, if anything, to give to scientific experts?-- In that regard I didn't, no.

Now, you were asked some questions about the levels of oxygen at point 14 on the analyser. Do you recall that?-- Yes, I do, yes.

And pointing out that it was recording low, you were directed to some points in relation to that; do you recall that?-- Between 20.4 and 20.6, yes.

And you mentioned that - in response to that - that notwithstanding it was consistently recorded-----?-- That is correct, yes.

Or consistently within that range?-- Consistently between .4 and .6, yes.

Notwithstanding the absolute values would be lower, is there some comment you can make about whether you could discern trends or not from the figures - notwithstanding?-- From the?

The O2 figures. I mean, otherwise, does the fact that the absolute values are lower stop you from using the levels of oxygen for trend purposes?-- No, it doesn't.

It obviously has an impact on the Graham's Ratio?-- From the formula stated, yes.

Now, were you aware that the analyser for oxygen is

paramagnetic analyser?-- No.

By contrast to all of the other analysers in that machine, which were infra-red, were you aware of the distinction?-- No, I was not.

Were you also aware that a paramagnetic analyser is susceptible to the influence of barometric pressure changes?-- No, I was not aware of that.

Barometric pressure changes, if what I have said to you is correct, could have an influence on which the analyser would record oxygen?-- Yeah.

Given what I've said?-- Given what you have said, it would, yes.

Now, you were asked - you were asked some questions then about the oxygen analyser which is referred to as an oxygor; is that correct?-- I'm sorry?

Let me read something to you - perhaps ask you to look at it - Exhibit 5A. I just want you to turn - Exhibit 5A is the completed SIMTARS report. I want you to turn to page 18, a section there dealing with the oxygen monitor?-- Yes.

And I want to direct your attention to the third paragraph?-- Yes.

Where, after having analysed various parts of that, does it conclude with this sentence: "The facts that have been discussed tend to support the premise the oxygor was operating acceptably prior to the explosion, and probably for some unknown amount of time after this." Does it end with that sentence?-- Yes, it does, yes.

If the oxygor is the oxygen analyser, that clearly enough reads that SIMTARS have concluded it was operating acceptably, regardless of calibration?-- That's what SIMTARS have got stated in the report.

Now, I want you to turn to page 41 of that document, and as you're doing so, can I remind you of some questions you were asked about the Graham's Ratio and the view that you held and maybe others held that after sealing, the Graham's Ratio is not particularly useful?-- Yes, because there is no air flow past it, yes.

Can I direct your attention to page 41 of Exhibit 5A under the heading of "Indicators of Spontaneous Combustion", the second paragraph where you'll see a reference to appendix 5.2A, referring to a paper presented by, amongst others, Mr Cliff; do you see that?-- 5.2A, yes.

Now, can I ask you to have a look at the - it is volume 2 of the SIMTARS material? Could you go to appendix 5.2A? You will see them noted at the top right-hand side of the pages, about two-thirds of the way through. Have you found that?-- Yes, I have, yes.

It is the paper that's referred to in the body of the report: "Early Detection and Monitoring of Fires and Heatings in Underground Coal Mines" by Cliff et al?-- Yes.

Can you turn to the third page of that paper, under the heading, "Main Findings and Conclusions", and perhaps you could just read as I read it out to you: "The current" - sorry, we will go back and check the date of this. I think it is - it is undated, but I think that it was 1991 for some reason, but we will have that checked. The part that I'm directing your attention to is: "The current mine fire indicators have significant limitations and are often difficult to interpret. Most only indicate the onset of a heating and are only valid in flowing air streams which are not complicated by dilution with air or seam gas. The best current indicator of the onset of a heating was found to be a Graham's Ratio. There was found to be no reliable way of monitoring progress of a heating particularly after sealing." Now, as you read that, that supports your view, doesn't it, that Graham's Ratio is not applicable after sealing?-- That is the way I would read that, yes.

1992, I'm told, is the date of that paper. So, in fact, there is some - it seems some support for the view you held and others may have held; would you agree?-- Obviously from that last sentence, yes.

You can hand those documents back, please. Now, you were asked some questions by Mr MacSporran, asking you what would you have done, how would you have viewed things. You have heard the sort of question a number of times. In fact, he asked you to direct your attention to one particular instance in the category of what would you have done, and that was if you had known that Morieson had flushed the goaf on 10 June because of a layering problem and then a week later on 17 June the same problem was encountered in the same area - do you recall those questions?-- Yes, I do remember that, yes.

Now, you answered the question in a particular way there, and I don't wish to rehash what you said, but would it have an impact on the approach you would take if, in fact, what was put to you wasn't correct; in other words, it wasn't a layering problem, there was no duplication of a layering problem, and you weren't getting the same problem repeated a week later - that was different?-- Right, yes, there would be a slightly different slant on that, yes.

In fact, as I understand it, no-one has said there was a layering on the occasion of 10 or 11 June when we know the goaf was flushed then. Morieson doesn't say it, Guest doesn't say it, and Bryon doesn't agree with it, those being the relevant three witnesses. You answered the question on the basis of the problem being repeated, didn't you?-- That's correct, yes.

If that's not so, it has an obvious impact?-- Yes, it would.

You were asked some questions - I think it's by Mr Martin -

directed to whether you had a part to play in the analysis of gas or gases at the mine in an operational sense - decisions about the significance of gases coming out of the goaf and that sort of thing. Did you regard that as primarily - or even part of your responsibility?-- No, that was not part of my responsibility, no, I didn't think.

That was for others?-- Well, I assumed that wasn't part of my position description to do that.

Now, I wanted to take you to some documents which you are perhaps not interested in looking at, but nonetheless I wish you to. It is volume 1 of that SIMTARS material - and Exhibit 127 will do. Have you still got Exhibit 127 with you - the alarm log?-- Yes, I do.

Now, Mr Clair asked you a number of questions about, in particular, the alarms signified on that log on - for 512 top return - that's point 16 on 2, 3, 5 and 6 August - do you recall that line of questioning?-- Yes, this morning, yes.

Now, one of the things he mentioned to you - if you turn to page 11 of appendix 2.1.7J - there may be no sticker left. It should be headed at the top, "Point 16, 512 Top Return", and I think they go in numerical order, so if you get to 18, go back?-- Which page, sorry?

Page 11?-- Page 11.

It says at the bottom, "11 of 26"?-- Rightio, yes.

And Mr Clair took you to about 10 lines from the bottom where the reading of 7.2 is noted. Do you see that reading at 6.01, 18?-- On the 2nd of the 8th, yes.

That corresponds, if you look then at 127, with the first alarm at point 16 on that day as recorded?-- Yes.

And you were directed to the fact that the set point value, that being the low side value gas high 1, was seven and breached by a reading just over that?-- 7.17, yes.

And you discussed with him the fact that normally it would go into alarm mode and the siren would come on and things would progress from there?-- That is correct, yes.

He then directed your attention to the next alarm which I think you will find on page 14 where the reading came in at 8.8 and it's about a dozen lines from the top?-- 11.09, yes.

At that point the set point was at eight as we can see from Exhibit 127?-- That is correct, yes.

So it's come in over the set point, it being the low set point again, gone into alarm mode and recorded on the log?-- Righto, yes.

You can see from the readings at that point that there were three readings in the space of about half an hour of something over eight, but that was out of the ordinary for what was preceding it and following it. There were three high readings and then gone again; is that right?-- That is correct. First one was 7.6.

If we just pause with those for a moment, what I want to ask you is this: put your attention back to 127. Mr Clair directed your attention to the fact that between then and the 5th the low level remained at eight by all appearances and he asked you questions about how that could be the case or wasn't the case; do you recall that?-- Yes, I do remember being questioned about that, yes.

Then he took you to the next alarm which is at the bottom of page 17 - sorry, just having looked at those three readings back on 14 - I shouldn't jump so quickly - in fact the readings that follow it for a long time are all under the low set point level of eight, aren't they, those three readings at 8.8 - two at 8.8 and one at 8.0. 11.09 through to 11.35 on the 3rd; do you see those, that's page 14?-- 14, yes. Yes, they are all seven.

There are three at eight then they drop back below eight, don't they, for the next couple of pages?-- That's correct.

We have heard evidence at the Inquiry that if an alarm is generated on the low level and the set point level is not changed as seems to be the case here, if the next pass or a subsequent pass goes below the low level it goes back into normal mode in green and that's assuming people have done the reset and so forth. So assuming those reset functions were carried out, what follows are 3 August of 11.09 through to after that would have been, if the reset function had been carried out, back into green?-- That would have to be the case, yes.

We know that probably isn't the case because Exhibit 127 shows the acknowledgment, not the acceptance, the acknowledgment was at seven o'clock in the evening?-- Yes.

Do you see that?-- Yes.

On that basis, if we go to the evening which appears towards the bottom of that same page, assuming that the acknowledgment was carried out as it should be, what follows then is a period of no alarms because it's under now the low set point level?-- Below eight, yes.

And remains so through to the 5th, so the next two days remains under that reading of eight?-- That is correct, yes.

That brings us to page 17?-- Yes.

So on the basis what we have heard at the Inquiry if the acknowledgment at seven o'clock in the evening on the third was carried out correctly, that point would not have alarmed or even remained in red or blue, it would have gone back to green for the next two days?-- Yes.

Now, down to the bottom of page 17 which is the next alarm occurring at 12.50 on the 5th, do you see that one?-- Yes, the very last line, yes - second last.

These numbers have obviously been rounded in the SIMTARS documents because we know from Exhibit 127 that it's 8.03 even though they call it eight?-- Righto, yes.

Because we also know from evidence at this Inquiry that if the gas comes in at the low point level it doesn't go into alarm, it's above the level that causes alarm. Now, at that point all things being equal the point would have gone into alarm mode?-- That is correct, yes.

And would have stayed so until accepted and acknowledged?-- Yes.

We see the acknowledgment is at 1.06, you will find that on the bottom of that page or between the bottom and the top of the next one, it falls between two readings and three readings after that. Do you see that?-- Sorry -----

The acceptance was at 1:06:49?-- Yes.

That doesn't correspond with an actual time in the SIMTARS material, it falls between the two times?-- 1303 and 1316.

Now, an acknowledgment occurred then we can see that on Exhibit 127?-- Yes.

As we know from the evidence in this Inquiry, even if it was carried out correctly but in its full entirety, acceptance at the annunciator and final resetting at the annunciator, even if this procedure was fully followed, if the next passes came in between the existing levels, that's between gas low and gas

high, if the machine would not alarm it would remain blue. We have that evidence from Mr Robertson. You perhaps weren't aware of that?-- No.

Accept that to be the case?-- Yes, thank you.

What then followed was that Mr Clair was saying to you, "Look at page 18. Look at all these readings of nine and eight and eight point something, right through over to page 19. How could it be the case that there were alarms going off all the time? How could that be so?" If what I've suggested to you is right, it wasn't going off by alarm, was it, because those points are falling between the set eight and the high set point?-- If that is correct the next time would be on 6/8 at 2021.

And so if what I say to you is correct, if that evidence that we have heard in this Inquiry is correct, there wouldn't in fact be on that point continual alarms through that period at all. It would remain blue and in accept mode because the level of gas is coming in between the pre-set levels?-- Sorry, I'll have to take your word for that.

Are you accepting what I say to be so?-- Yes, please -----

That follows, doesn't it?-- Yes.

We can tell from Exhibit 127 that the set point was not raised above eight. We can see that because that alarm that I've been referring to at 12.50 on the 5th is then repeated by another alarm the next day at 7.49 in the morning and the set point is still eight, isn't it?-- That is correct, yes.

So if we turn then to page 19 of that volume that I've asked you to look at we will see at about point 6 on the page the entry for 7:36:33 and the entry for 7:49:41; do you see that?-- Sorry, whereabouts?

About point 6 on the page, point 6 on page 19, time 7:36:33?-- Yes.

And that level of gas was 8.0?-- Yes.

That's not the alarm in fact. The alarm came at the next one. In other words it's not the alarm when it hit the alarm level, it's the alarm when it came in above the alarm level?-- Right.

In fact if what I've said to you is correct, that is to say that alarm mode is only above the set point, then when it came in at the set point it probably went back to green?-- Righto, yes.

And then alarmed again at 7.49 because it went into green and now breached clearly the low set level?-- The low set level.

It must be so because if it merely came in between the points it would remain blue -----?-- Right.

----- and not alarm. So the fact that it did means it's passed back to green?-- Righto, yes.

And then it seems, would you agree from looking at Exhibit 127 - I think Mr Clair made this point to you - that the set point must have been raised to 10 at or about that time because the next alarm which is at eight o'clock that evening reveals a set point at 10?-- That is correct, yes.

And if that's so then what follows after 7.49 in the morning will not be any alarms, will it, because it's all below the low set point?-- That's correct, yes. Wouldn't be alarming. The siren wouldn't go, no.

So if the acknowledgment was carried out correctly at that one which went off at 7.49 on the 6th then that point remained green thereafter until 8.20 in the evening when it alarmed again, if what I've said to you was correct?-- That is correct, yes.

So accepting what I say about the state of the evidence in this Inquiry it's just not the case that alarms were going off and off and off and off and being ignored, is it?-- No, from that evidence it wouldn't be, no.

Of course Mr Clair's other point was referring to the absolute value of CO, wasn't it?-- Yes.

That's not what I'm talking about. You can hand those back. You mentioned in answer to a point that Mr Clair raised about those figures that the regulator had been changed, there had been an alteration to a regulator on 5 August?-- That is correct, yes.

That's the Friday. I think you said that was the 5 South regulator?-- The 5 South bottom return, yes.

And that's the one you indicated to us yesterday or the day before was at about cut-through 19 on the bottom return in 5 South?-- Between cut-through 19 and cut-through 20.

Are you aware for how long that regulator was left open or altered?-- No, I can't say how long it was open or closed for.

That would certainly have an impact on the air quantities for 512 and velocities?-- It did have when Dick Stafford took it, and if it remained in that state it would affect the CO, yes.

That sort of feature, that is to say alterations to regulators, has an impact on velocities in the area of influence, doesn't it?-- It did, yes - it does.

You were directed by Mr MacSporran to a spot reading by Mr Tuffs on the evening of the sealing?-- Yes, I was.

Do you recall that?-- Yes.

And I think what happened was that they took some sort of average point rather than Tuffs' actual reading together with

a velocity that he took?-- They took the spot point of the Unor at the time -----

Not what Tuffs got on his Drager?-- That is correct, yes.

That makes a considerable difference straight away, doesn't it?-- It makes a very considerable difference, yes.

If you knew that at the time and place where he took that reading, which was in the vicinity of the top return, (1) the belt road seal was either completely finished or just about; (2) the No 2 seal was well on the way up?-- That's correct, yes.

And (3) so was the top return seal?-- That was Mr Tuffs' comments, yes.

And (4) that the regulator that exists between the top return and the bottom return of 5 South had been partially knocked down?-- Yes.

And (5) that the mandoor between headings 1 and 2 that go into 512 had been left partially open?-- Yes.

All of those things would have an influence on the veracity of Mr Tuffs' reading?-- On the velocity reading that is correct, yes, even - yes. His reading of 1.81 was as if the panel had been completely opened which we know from his statements, from what he told me in the note that I put on the log that he had closed - that certain headings had been closed off. We have reduced the - would have reduced the velocity through the panel - sorry, the air flow through the panel.

Now, you were asked some questions also by Mr Neilson directing your attention to the 512 goaf and he asked you about phenomenon of wafting which seems to have come from a past generation, but may have a different name now, and he was directing your attention to the 512 goaf saying given the shape of the goaf and everything else wouldn't you expect that phenomenon to be there. Now, in terms of the behaviour of the ventilation in that sort of goaf, that is to say a partial extraction goaf where you have some pillars and some remnant pillars, would you expect the performance of 512, that is the air in the 512 Panel, to be any different to any multi-directional multi-heading panel?-- No, a bord and pillar partial extraction system I would have expected to behave fairly consistently with what else we had - with other sections that we had in the mine.

You were also asked whether in approaching an investigation of any incident, and when I say "incident" I mean - I think the context was a high reading or a smell or -----?-- Yes.

Whether you would adopt a worse case scenario or a best case scenario, and you mentioned the worse case scenario?-- Yes.

But if the true object of the investigation surely is to get to the facts?-- That is correct, yes.

If you ascertained the facts and the facts didn't support the worse case scenario, you wouldn't blindly adhere to a worse case scenario, would you?-- No, I didn't, that's why the p.m. reading was put on as a true CO make.

And lastly Professor Roxborough asked you whether spontaneous combustion had been taken into account into the design of 512 - I shouldn't have said lastly, that was a lie - I think you said no to him. Have you given that some more thought in fact?-- Yes, I have. With regards spontaneous combustion, the length of the panel had only been - was only scheduled for a three month or 12 week extraction period, and in that regard I remember talking to Albert and saying that because it's only three months we have had panels that had lasted significantly longer and that's why we had put that to the back of our mind, you know, like Mr Neilson said, because we had said that it would be only a three month period it didn't seem to be a problem - wasn't going to present itself as a problem.

So in fact it was considered, but in some particular way?-- That's right, yes.

And it's a fact that the Part 60 approval required that a risk analysis be done, and we know that is the mine risk analysis that has been tendered here, and were you aware that in fact did consider the question of spontaneous combustion as one of the risks of extraction in the panel?-- I was not made aware of that, but I haven't seen the risk assessment as such.

Can I ask you to have a look at Exhibit 110? Mr Parkin was asking you some questions about Exhibit 21 which you may or may not still have with you - I don't need you to have it - in directing your attention to the graph which takes plottings right through to either 5 or 6 August and he asked you to comment on the steepness or the rate of rise between mid June and mid July and so forth?-- Yes.

Now, if you turn three pages into Exhibit 110, will we there

see the CO make graph for 15 July?-- That is correct, yes.

The questions were directed to your view of the situation as at 15 July. As at 15 July that's the document you would have had; is that right?-- As at 15 July, yes.

And quite apart from absolute numbers, it bears a different appearance from the one that you were being shown in Exhibit 21, doesn't it?-- Yes, it does, yes.

And it may have a different impact upon persons looking at it just for the visual assessment?-- Yes, that - yes, it would.

You can put that back?-- Just to clarify, that's why the peaks and troughs taken out of that from 27/4 would - it gives you an indication, if you take that big step out there, that you have got a consistent rise.

We know that when Mr Kerr came to the mine on 22 July he did in fact look at some of the graphs for 512 or a graph for 512, he just couldn't remember which one. It was either that one or the one for the 22nd, wasn't it?-- I can't comment on that. I don't know if I showed him or if he had seen some other graphs.

Well, he certainly saw comparative graphs, we know that from his evidence. One of those was a graph for 512?-- Right.

As at the afternoon of the 22nd the only ones it could be would be the 22 July graph or the 15 July graph?-- That is correct, yes.

Could I just ask you to look at Exhibit 161? I don't know if you have it with you still. I suspect it's what might be called the new Ellicott Diagram. Do you still have it with you?-- 161, yes.

The "for illustrative purposes only" document?-- Yes, I do, yes.

Do you know of any analysis system currently in use that would avoid this idea of plugs?-- The only system would be monitoring on an every minute basis, every second basis, yeah.

You don't know of any Unor system that can overcome that question?-- No, no.

Assuming it has some validity?-- No, I wouldn't know, no.

I have nothing further, Mr Abrahamse. I am tempted to say might he be excused?

WARDEN: Mr Parkin has some questions.

FURTHER EXAMINATION:

MR PARKIN: Mr Abrahamse, just if we go back to that Exhibit 21, just a brief comment on what Mr Morrison has had to say?-- Sorry, 110 or 21?

If you go back to 21 initially?-- Yes.

The point Mr Morrison makes about Exhibit 110 about the steepness of the curve, I think my question was - I mean, it's quite deliberate - that the goaf was flushed on 16/6; you remember that?-- Yes.

We have established that?-- We have established that, yes.

MR MORRISON: Excuse me, sorry. I don't mean to be rude, but I don't think that is in fact established. I am not looking for back-up, but my recollection of the evidence is Cocky Morieson flushed it on the 11th or the 10th and the incident where McCamley, Robertson et al were involved was the 17th when they opened the stoppings.

MR PARKIN: Well, okay, let's assume then that the goaf wasn't flushed on 16/6 and my information was it had - the point I am trying to make, and I will make it again for clarity, is that from 16/6 to 15/7 the CO make in litres per minute was doubled?-- That is correct, yes.

In a four week period?-- Four weeks, yes.

And I asked you - I said if that rise - does it indicate a steep rise?-- Yes.

Would that give you concern, especially when we are talking about a reading of nearly 15 lpm?-- My answer to that was you have to look at that total graph in context taking the peaks and troughs out of it, and if you took out the peaks and troughs you got a constant rise, but, yes, if you had - if you looked at it in an isolated event, it is a steeper rise than the average.

And the point was that it's doubled in a four week period, the CO make had doubled in a four week period?-- From 7 to 14, yes.

And that your information from Mines Rescue was that over 10 lpm you start to look for a problem?-- That is correct, yes.

And here we have got 15 lpm, and I said if you associated that reading with any knowledge of benzene or haze or smells in early June, what would your conclusion be?-- Like I said to Mr MacSporran before, if you had 5 lpm and you smelt a benzene or tarry smell, you would still want to investigate that.

Thank you.

WARDEN: Thank you. Nothing further?

MR CLAIR: Your Worship, there is one point that I will clear up. It's too important to leave in confusion or obfuscation.

FURTHER RE-EXAMINATION:

MR CLAIR: Have you got Exhibit 127 there in front of you, Mr Abrahamse? Do you recall you were being asked some questions by Mr Morrison about my questions earlier to you about that alarm sequence there?-- Yes, I do.

Now, Mr Morrison was taking you through the sequence of things, particularly between that alarm which occurred at 12.50 on the Friday through to the alarm the following morning at 7.49. I don't need to take you back to that other volume, but if you think you need it, just say so. There were a number of points between those two times which illustrated levels - in fact, quite a number of points that illustrated levels still between the set point value of 8, or above the set point value of 8 is the best way to put it?-- Yes.

And what he is suggesting to you is that in fact the alarm didn't become active again until there was a reading less than 8 some time just - or immediately before that alarm that's shown on the log at 7.49 the next morning?-- Yes.

He took you through that?-- He took me through that, yes.

Now, in the course of that - and doing what I thought was a fair imitation of my tone - he put to you something which failed only in terms of the script, because he was suggesting that I said to you, "Well, now, what about all of these alarms and sirens that were going during that period of time?" Do you remember he put that to you?-- Yes, yes.

Whereas in fact what I asked you in respect of that is whether you had any idea as to how those points could be registered without the alarm actually being activated; do you remember that? The question I was asking you was how could all those points above 8 be registered without the alarm being activated?-- And I gave the idea of possibilities of low and high readings change, on my assumptions.

What I was putting to you about sirens going off and alarms being tripped on the Unor and being registered and showing up on the Unor related rather more to the points - the alarm points that had been logged for 2 August, first of all, at 6.01; you see that?-- Yes, I do.

3 August at 11.09, 5 August at 12.50; do you see those?-- Yes, I do.

And I was asking you, first of all, whether you were ever made aware of the sirens going off at those times and I think you

told me you weren't?-- I was not.

Whether you heard any sirens yourself going off at those times?-- I can't recall that.

And whether anybody ever came to you to discuss with you the fact that there was in each of those cases a reading above the set alarm point coming in from the 512 top return, and I think you said that nobody ever did?-- That is correct, yes.

And I think you told me that if you had been made aware of the levels that tripped the alarms on those occasions, that you would have been prompted to carry out some further and proper investigations in relation to 512 top return, isn't that so?-- To understand what velocities were running through that regulator - past that monitoring point, yes.

And it was in that context that I suggested to you that somebody - if not you, somebody else at least might then have resorted to those velocity and CO in parts per million readings that were being taken by the deputies shift by shift?-- Yes.

And which indicated at least at points during that week particularly high make of CO in litres per minute, isn't that right?-- On those occasions yes.

You saw that on the other exhibit?-- Yes.

I don't need to take you back to it. Thank you.

WARDEN: Thank you, witness, you may stand down. You are excused. You may leave, which I am sure you will be pleased to hear.

WITNESS EXCUSED

WARDEN: Before Mr Boiston makes a rash promise, we won't start any other witnesses this afternoon and we will see you back here Monday at 11 a.m. Have a safe journey home. Thank you.

THE COURT ADJOURNED AT 4.06 P.M. TILL 11 A.M. ON MONDAY, 20 FEBRUARY 1995

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 20/02/95

..DAY 28

THE COURT RESUMED AT 2.09 P.M.

MR CLAIR: May it please Your Worship I call Ian Joseph Pearse.

IAN JOSEPH PEARSE, SWORN AND EXAMINED:

MR CLAIR: Your full name is Ian Joseph Pearse; is that correct?-- That's correct.

You are an electrician employed by BHP Australia Coal at Moura No 2?-- That's correct.

You've worked at that mine as an electrician for 18 years; is that so?-- Yes, sir.

You are employed as a shift electrician and you have a range of duties?-- Yes.

Amongst other things you do maintenance on equipment, you test and repair and install electrical equipment; is that so?-- Yes.

That includes equipment on the surface and underground?-- Yeah, that's correct.

Now, there was a monitoring system installed at the mine, a Maihak brand Unor monitoring system; is that right?-- Yeah, that's correct.

Do you remember when that was?-- I can't be certain, but it was quite a few years ago, several years ago.

Since it was installed have you been regularly involved with a testing procedure called span gas testing?-- Yes, that's correct.

Is that test done at regular intervals?-- Well, it's done on a monthly basis, once a month. Yeah, once a month.

Are there occasions when it's missed or is that religiously once a month?-- Could go a week over, but it is - yeah, virtually religious, once a month.

Do you have some familiarity with the system apart from just being involved with the span gas testing?-- No, actually all I was really shown was how to set it up to do the span gas tests.

Do you have any involvement with the system apart from when you are doing the span gas testing? Do you operate it at any other times?-- No, well, as I say, that's - all I've ever done on it is the span gas test.

That's good. Now, when you do that span gas testing there are a number of people involved; is that right?-- Yes.

It involves somebody being at the surface to watch the monitor?-- Yes, correct.

And then one or two people down below?-- Yeah, that's right. Well, actually it's always the deputy goes down underground to do - because, you know, you have to go in the returns and things like that to do your tests, so it's always the deputy.

Sometimes you carry out the function on the surface and sometimes you go below, is that correct, with a deputy?-- That's correct, yeah.

Were you on duty at the mine on Sunday morning shift, the day shift, 7 August of last year, the day of the first explosion?-- Yes, I was.

Were you there for the specific purpose that day of carrying out the span gas testing or was that one of your normal shifts?-- No, that was my shift to do on that Sunday, yes.

Did you work regularly on a Sunday?-- Fairly well, yes.

There was a span gas test scheduled for this Sunday?-- Yes, that's correct, yes.

At the time that you started duty on that date did you know that the 512 Panel had been sealed the previous night through to the early hours of the morning?-- Not until I started work on Sunday morning was when I found out that they had sealed the panel.

Who told you that first of all?-- There was just talk that was - someone standing around said, "She's been sealed."

Now, in order to do your span gas testing did you take up with Mick Caddell, a deputy, and another chap named Brian Kelly one of the miners there?-- Yes, that's correct.

Do you know what time you started doing the test that morning?-- Possibly - I couldn't be quite sure, but it's around 8.30, 8.35, I think. It was after half past eight.

In order to do the span gas testing you had to work out a sequence of monitor points to test, normally speaking?-- Yes, correct.

So that they could be done in groups; is that right?-- That's correct, yes.

Were you to stay on the surface that day -----?-- Yes, I was.

----- to watch the monitor?-- Yes, to watch the monitor.

While Mick Caddell and Kelly were to go underground?-- Yeah, that's correct.

After they left to go underground did Michael Squires come and speak with you?-- Yes, he did.

And what did he say to you?-- Michael said that they had sealed 512 and possibly during - while I was doing the test could I keep 512 on the monitor screen.

Did you agree to do that?-- Yes, sir.

Was that something that was easily done?-- Yes, because instead of deactivating the points you just left it at that so it stayed up on the screen all the time.

You did the sampling with groups of four points; is that right?-- Yes, that's correct.

Had you worked out before the others left to go down below which groups you were going to do?-- Yes, yeah, because that relies on like distances that Mick had to travel and that sort of - so if you put once in a certain area to them - you know, that's the way we grouped them.

Did this arrangement to keep 512 active interfere with the plan that you had already discussed with those that went below?-- No. No, there was no problem at all to it.

You did in fact then go ahead and there were a number of points sampled at each time, but you kept 512 active right through the morning?-- Right through the morning, yes.

And we have been told that with the Unor system what is happening in effect is that if there are 13 points active then each point is sampled one minute out of every 13?-- Yeah, that's correct.

With the span gas testing on this particular morning how many points were active at any given time including 512?-- Well, there is three plus 512, four.

Four points active, and what did that mean as to the regularity of testing 512?-- Well, that would be every four minutes or so - four or five minutes 512 would be up on - being tested.

Could the witness see Exhibit 11, please, Your Worship? 11A is a better version if that's with it. Have a look at 11A, if you would, Mr Pearse. It's a better photocopy than 11. The front page of that, do you recognise that?-- Yes, that's the sheet I used to do the tests.

That's your handwriting on the sheet, is it?-- That's right.

Did you draw that up according to some pre-determined format that you had for this sort of thing?-- Well, this was - this sheet was just pinned up on the wall there, so I just grabbed it and it had the top part already written and I just followed it through as I went through.

You wrote the date in, did you?-- Yes, yes, I wrote the date.

And then all the other figures?-- Yeah, correct.

You can see there the order in which the points were tested; is that so? Does that set out the order in which they were tested?-- Yes.

You can see that from the "Time sent" column; is that right?-- That's right.

They are all in order there. You see in respect of point 18 there that there are no results -----?-- Yes, that's right.

----- written in. Can you tell the Inquiry what you remember in relation to point 18 on that day?-- While I was doing the test, yeah. Well, point 18, when its turn come to be sampled there I just sat and waited and waited and waited and nothing came up, and when Mick come up afterwards I said to him, "What time did you put that sample through?", and that's the time written there, 10.58, and I just had not received a sample from point 18.

When you say when Mick came up you asked him that time, the "Time sent" column, how did you fill that out? How did you know which order -----?-- Well, Mick Caddell took the - when he put in a sample he wrote down the time that he put in the sample which is the time sent, and I wrote down the time when I received the sample in the time arrived.

Did you write it on to some other sheet?-- No, this is it here.

You wrote it on to there?-- Yeah, when Mick done it, when Mick put the sample in - say at 8.35 he put a sample in and I received that sample at 8.49, he had written that down -----

Where would he write that down?-- Probably on a notebook or something like that.

Then he would come up and fill in the column after -----?-- He told me what his times were and I just fill it in.

But the order was already pre-determined, was it?-- That's correct.

And listed on the sheet before he went?-- Yeah.

You got that time of 10.58 then in respect of point 18 from Mick Caddell?-- That's correct.

Were there any things that occurred in respect of point 18 that might in any way explain why you didn't receive a sample up there?-- No, no.

Nothing that you were aware of?-- No.

In respect of all the other points that were tested that day,

you wrote in - well, you got Mick Caddell's figures, no doubt, for time sent and you calculated the time periods then in the final column?-- Mmm, that's correct.

I think one of those has been amended, just a case of correcting the subtraction. Somebody else has amended that; is that right?-- That's correct.

Now, in the course of carrying out all those tests then, would point 5 have been deactivated at any time? Was there any time when you wouldn't have been getting access - I mean, given that it was sampling one every four or five minutes, but was there any time during that whole testing period when point 5 wasn't activated as a point?-- Well, only during the time that it took to do the test because we did the test on point 5 -----

While you were doing the span gas test?-- Yes.

How long would that have taken?-- Well, in between 5 and 10 minutes of gas, so roughly between 7 or 8 minutes, or something like that.

And that was at 11.26 that that was put into point 5; is that right?-- That's correct.

Go on?-- Sorry?

Were you going to say something?-- I was just clearing my throat.

Now, this point 5 that was mentioned on that Saturday - on that Sunday morning, I should say, you knew to be the monitor point which was located behind the seal in 512 Panel?-- That's correct.

And had you been associated with the placing of that monitor point there the previous day on the Saturday?-- That's correct.

What shift did you work that day?-- Day shift. On day 7 till 3.

What involvement did you have with locating that seal - that monitor point behind the seal?-- Well, the job had been started on the Friday night by two other electricians, and I come in Saturday morning and I was asked by Michael Squires to move this point, and he showed me where he wanted it, and this has been started on the Friday night. I come in Saturday and we completed the job, and we run the tube down the line and hooked into the other point down the bottom.

What time did Michael Squires speak to you on the Saturday?-- Be after smoko. Probably between 9 and 10, I'd say. I can't give you exact times.

Now, you say the job had been started by the electricians, two electricians, on the Friday?-- Yeah.

That's the job of relocating a monitor point to this position?-- Yeah.

Which monitor point was it that was to be relocated?-- Point 5.

Point 5, from where?-- Which was down the bottom return, and it was to be brought up and put in through the seals.

If you don't mind standing up and just putting over the front plan that's up on the whiteboard there. Just put it over to the back; you will see another plan underneath. Have a look at that one for a moment so that you can acquaint yourself with what's shown there. It's a plan of 512 Panel and the areas just adjacent to it?-- Yes.

You see where you are there?-- Yeah.

Now, if you don't mind sitting down so we can hear you through the microphone and take up that laser pointer there. There is a switch on the side and it will produce a red light up there on the plan?-- Is it straight on? I have just got to hold it on?

Yes, that's right. Now, first of all, you were familiar with the location of point 5 prior to the - well, prior to the other electricians beginning to shift it on the Friday; is that right?-- Yes, that's correct.

Where was it?-- Down in there somewhere it was.

You are indicating there just inbye the seal in that No 5 heading of 512; is that right?-- Yes, that's correct.

Now, when was the last time that you saw it down there?-- I'm not really sure really.

Would it have been only a couple of days before that Saturday when you were party to moving it or would it have been a couple of weeks? I am just trying to get some indication?-- Yeah, I know. It could be a couple of weeks or so, yeah.

At the time you saw it there, was the seal up in that No 5 heading, that's the final seal?-- No, no, the final seal wasn't up.

It wasn't?-- No.

Now, then you moved it to that position that you located just a moment ago on the plan?-- Yeah, to there.

Which was behind the seal in No 3 heading of 512 Panel; is that right?-- Yeah, that's correct.

And you were shown where it was to go, did you say?-- I was shown by Michael Squires where it had to go, yeah.

Did he have any discussion with you about the position that it

was to go, or did he just tell you that's where it's to go?-- He just told me where it is to go.

Were you there when Michael Squires discussed that with anybody else?-- No.

Okay. Now, you say that the job had been started on the Friday night by another two electricians. At the time that you were asked to do it on the Saturday, was there any indication to you as to when 512 Panel was to be sealed?-- No.

You were just asked to -----?-- I was just asked to do - just to relocate that.

Was there any suggestion that you had to do it as a matter of urgency or that you could do it, as it were, at your leisure that day?-- Well, Michael Squires just said he wanted the point put behind the seal - where the seal was going to go, and that was it.

What was involved in relocating that point?-- I'll just use this?

Yes?-- Well, originally the tube run down to that corner and then went into there.

Just so that we can have something on the record, you are indicating - as far as is relevant, you are indicating it was running along from - in 0 cross-cut of 512 from No 4 heading down to No 5 heading and then down in No 5 heading towards cross-cut 1; is that right?-- Yeah, that's correct. Yeah, well, the electricians had started from there and they had brought the tube out to that corner.

That's from the ultimate location in No 3 heading out to 0 cross-cut and 3 heading?-- That's correct, and then I grabbed onto the corner and run it down to there, down to that corner and broke the tube there that run down into there and connected it on.

You are saying you connected it into the old tubing at the junction of 4 heading and 0 cross-cut?-- That's correct, but then after it was finished I come back in here, checked the position of that point 5 and just checked to make sure the tube was hung along and down to where we had done the job.

The other monitor point that had been associated with 512 Panel was which one, monitor point 16; is that right?-- Yes, that's correct.

Now, when you last saw monitor point 16 before that Saturday morning, where was it?-- Well, I can't answer that because I don't know where it was, no.

Well, when did you last see it prior to the Saturday?-- Probably months and months before.

Months and months before?-- Yeah.

You didn't have to go and check it or do anything in relation to it at any time?-- No.

Where was it then that you saw it months and months before?-- I'm not quite sure really, but I think it was - I think it was in here somewhere.

You are indicating a position just inbye the seal in the top return in 512; is that right?-- Yeah, I think that's where it was, up in there.

And you think that was months and months before?-- Well, it was, yeah.

As part of your involvement in the span gas testing procedure did you need to be informed about the changes in location of monitor points?-- No.

You didn't?-- No.

It wasn't anything that concerned you?-- No.

Now, on this Saturday were you asked to do anything in relation to point 16?-- No.

And you don't recall going into that area of point 16 at any time on that Saturday?-- No, that's correct.

If monitor point 16 had to be relocated in conjunction with the sealing, would you expect either to be directly involved with it or to be aware of the fact that other electricians were asked to relocate that?-- Well, I tell you what, after this has all happened, sort of thing, I have been talking to Allan Morieson and he told me that he had moved it out into the - up where it is.

Allan Morieson told you that?-- Yes, a deputy.

I wonder if the witness could see Exhibit 127, please, Your Worship. I don't know whether you have seen that document before?-- No, I haven't.

It's a log of the alarms that were registered on the Unor system from 27 July forward to the time of the first explosion. Now, I don't want to go through these in detail, but you will see in particular - I think you have got a technicoloured version there; is that right?-- Yes, that's correct.

You will see that there are some alarms that registered at monitor point - or in respect of monitor point 18 on that Sunday during the time that the span gas testing was done. If you go just past the green line in respect of point 5, about - not quite halfway down the page, you will see two monitor point 18 alarms there together?-- Yes.

Between the green and the orange stripe?-- Yes.

The first of those was at 10:04:26 and the next was at 10:47:43. Now, were you in the monitor room when those alarms registered?-- Yes. Yes, I was.

What happened in relation to those? You will see that they are methane alarms?-- Yeah.

In fact on gas high 2, it seems because they breached a set point value of 2 with a reading of 4.55 -----?-- Yes, I see that.

----- in the first case and 4.59 in the second?-- Mmm.

Now, can you tell the Inquiry what happened in respect of those alarms?-- Yes. Well, point 18 would have been up on the screen at the time I was doing the tests, and I was using 44 ppm CO to do my tests, and I got an alarm up on methane, high methane, so - and I looked outside the window there and there was Lex Henderson, a deputy, out there, so the siren went off and I - and I stopped the siren and I raced outside and grabbed Lex and brought him back in to show him the Unor monitor, what it was reading.

Did you have some conversation with him about it?-- No, well, he just said - I just asked him, you know, "What's happening, Lex?" I said, you know, "I'm using CO and this is a CH4 alarm.", and he just said, well, Bob Newton was down draining the water out of the gas drainage line in 510, yeah, 510 north return.

What, did you accept that as an explanation as to why the methane alarm would go off?-- Well, he is a deputy and I respected his decision.

At that time you say - and this would be on the first alarm at 10.04; is that right, that you are talking about?-- Yes.

You say that the siren went off and you accepted the siren; is that right?-- That's right.

That was by pressing a button on the Con Log?-- Yeah, that's correct.

Now, that shut the siren down?-- Yes.

Did you do anything on the Unor screen before you went out and got Lex Henderson?-- No, I didn't.

You brought him in, so your Unor screen was still flashing red at that point?-- It was still flashing red active, yes.

And registering a little flashing red square for the alarm?-- Yes.

Did you yourself then acknowledge that alarm on the system or did Lex Henderson do that?-- Well, after I spoke to Lex and he told me what had happened, he said this is okay, so then I accepted the alarm and -----

That's on the Unor screen?-- On the Unor screen.

How did you do that?-- I pressed - we had a mouse on this one and we just moved it across to the alarm accept, pressed that, and then there is another screen come up with numbers. You had to put in, I think, a number between 0 and 99. You just put in any number and that accepts the alarm.

Well, you put in any number. Did you have to do something else then?-- Yeah, and then I just reset the siren, the Con Log.

Did you? What about on the Unor system itself? Before you reset the siren at the Con Log did you have to do anything else to -----?-- Besides you press "okay". It comes across to "okay" and then you hit that and go back to the screen.

Did you do anything to actually reset the level?-- No, I didn't.

The set point value?-- No, I didn't.

Were you able to do that yourself?-- I knew how to, but, no, I didn't touch that.

But did you - as a matter of practice, did you at any time go ahead and actually reset alarm levels yourself?-- No, no, not - under instructions from a deputy or undermanager.

So, you would only do it - you wouldn't reset a level unless you had instructions from an undermanager or a deputy; is that what you are saying?-- Yes, that's correct.

And if you did reset - well, if you did have those instructions, would you then go ahead and do it in the system? I mean, you would know how to do it in the system?-- I know how to reset alarms, yes.

Was it something you were called upon to do very often?-- No.

Change those levels?-- No.

Set point values?-- No.

Now, you will see if you look at that log that there was then another methane alarm at gas high 2 - that's the upper level alarm, I've been told - an alarm some 10 minutes after that first one was reset - or acknowledged, I should say - it was acknowledged at 10.37 on the Unor. You see that from the previous line. About 10 minutes after that, there is another alarm registered. Had you reset the Con Log by then?-- Yes, I had, yes.

So, the siren went off again, did it?-- Well, I'm not sure.

You are not sure about that?-- No. I know I got the first alarm for sure.

How many sirens can you remember going off in the course of that morning?-- I would have to refer back to that other document - all those test points.

So, there were sirens going off when the test points came through?-- That's correct.

So, there would have been quite a number of sirens going off in conjunction with the span gas testing?-- Yes.

And you are unable to say whether the siren went off again at this 10.47 alarm?-- Yeah, that's correct.

But you will see once again that that has breached the gas high 2 level, being a set point value of 2, with a reading of 4.59 on that occasion?-- Yes, I see.

You were still there then?-- Yes.

What did you do on that occasion?-- Hang on, this is this 10.51 one you are talking about?

10.47 was acknowledged at 10.51?-- That's one I don't know. I didn't hear that one; I'm pretty sure of it.

You don't think-----?-- No, I don't think-----

You don't think you did anything on that one?-- No. But I accepted that first one at 10.04. That's the one I first-----

Okay. Well, if you go beyond the orange line which deals with the CO alarm on the 512 seals, you will come again to point 18 with an alarm going off at 11.58?-- Yeah.

Were you still there at 11.58?-- Yes, I was.

And do you remember that occasion? I mean, did a siren go, or did it alarm on the screen?-- Yes, the siren went off again and it showed up on CH4 alarm, so I reset the siren and went out - by this time I went around to the deputies' cabin because there was no-one around and Lex was sitting there and I grabbed him again and brought him back around and showed him the same thing again.

And you are quite sure that a siren did sound on that

occasion?-- Yes.

11.58?-- Yes.

Was Lex Henderson actually in the deputies' cabin, do you remember, when you went around, or-----?-- As far as I know, yes. I'm pretty sure he was.

What happened after you spoke with him?-- Well, he followed me back around again and I showed him and he said, "Oh, well, Bob is down there again.", just after crib, doing the same thing.

Well, we see that that one was acknowledged at 11.58.35, which is very, very shortly after the alarm was registered. It is only 31 seconds afterwards?-- Yeah.

Do you see that there?-- 11.58 - yeah.

You see the alarm is registered at 11.58.04 and it was acknowledged at 11.58.35?-- Mmm.

So, it seems that it was actually acknowledged on the Unor screen about 31 seconds after it sounded?-- Well, it took me the time to walk around there to get him to bring him back.

So, could that have been the - I mean, if it was a siren that you heard, what would you have done first?-- Stopped the siren.

By pressing-----?-- By pressing the accept button on the Con Log.

Do you know if you went straight to the screen and acknowledged that alarm or did you see Lex Henderson-----?-- I went to the screen when it went off and then I went and grabbed Lex.

You didn't acknowledge it at the screen?-- No.

So, would it have been this one here at 11.58 that you are referring to, because it seems that that was acknowledged only 31 seconds after it actually sounded, or was registered?-- No, I can't account for that.

I mean, were you noting the times yourself on this day?-- No - well, the only times I wrote was what I did on the test.

On that sheet. Well, 11.58 - all we can say from the sheet is that that was certainly during the time that the span gas testing was going on?-- Yeah, that's correct.

Because it went from 8.35 at least - or before that - through till - 12.36 seems to be the latest time registered there. Okay. Well, it seems that point 18 registered another alarm then at 12.22. That was about 25 minutes later, actually - 24 or 25 minutes later. You see on the next line, "12.22"?-- Yes, yeah.

And then you will see that that one was actually acknowledged about 28 seconds later?-- Mmm.

Do you remember whether a siren went off on that one?-- You know-----

And that you went through the same procedure of accepting the siren and-----?-- Well, from what I remember, I got one siren in the morning and one after lunch, and that's the two that I showed Lex and that's the two we reset. The others I have no recollection of.

You are not too sure of?-- No.

You see, if you come down two or three lines further, you will see that, in fact, there is another alarm registered in respect of point 18, but that was at 12.33.50?-- Yes, yes.

That was accepted about - not quite a minute later; do you see that?-- Yes.

Accepted at 12.34.46?-- Yeah.

Could that have been a siren that you heard-----?-- It could have been-----

-----or alarm that you were aware of? Would that have been the second one?-- I would say so - by the time it takes to walk around and grab Lex.

You say you found Lex in the crib room?-- In the deputies' cabin.

In the deputies' cabin?-- Yeah.

Do you know whether he was just finishing crib or something at that stage, or-----?-- I think he was - yeah, possibly just finishing crib.

You say that could be the one at 12.33?-- Mmm, possibly, because it would take a minute by the time I got down there and spoke to him.

He could have come back and then accepted that himself, as you suggest?-- Well, no-----

Sorry, not accepted it, had a look at it and then you would have accepted it?-- That's correct.

In which case you really don't know what happened in respect of - if that was the second one, you don't know what happened in relation to those two in the middle at 11.58 and 12.22?-- No, I don't.

You have no particular memory of sirens going off or even accepting those alarms?-- No, I haven't.

Could you have been absent for a time and someone else accepted those?-- Not as far as I know.

You were there right through?-- Yeah, I was there right through.

In terms of accepting alarms, how many people, as far as you were aware, were in a position where they could do that - that is, knew what to do?-- Well, I'd say most electricians and that, but I'd say other people must have known how to reset them, because we weren't there 24 hours a day - electricians - so other people must have known.

And in order to accept them, you say that - without going right through the procedure - as part of that procedure you would put in two numbers - they were any numbers - random numbers?-- Yes, random numbers.

There was never any suggestion that you should put in a specified number that could be identified with Ian Pearse?-- No.

Can I ask you this: who taught you about this system?-- I was just shown how to use it by Max Robertson.

Now, I want to ask you about some other features on that document in front of you there. Just before I do, do you still have Exhibit 11A there?-- No, he flogged it off me.

Keep 127 and put it to one side. I just want to ask you about 11A. You will see that in respect of monitor point 8, the gas reading is actually 29, whereas I think you have told us that you were putting through CO mix with 44 ppm; is that right?-- That's correct.

And it appears from that that point 8 is not registering anywhere near as high as it should?-- That's correct.

Now, what would that indicate to you?-- That would indicate either a crack in the tube or a broken tube, or something like that, but it is - that is just monitoring atmosphere.

When you got that sort of result during span gas testing, what would you do?-- Well, I discussed it with Mick Caddell and he said he would notify management, and then I would write it in a log - in the shift report - that point 8 has to be repaired or checked again.

And did you do that that day?-- Yes, I did. Hang on, no, I wrote point 18 had to be redone. Mick Caddell was going to notify management that he had a lower reading.

Had you been told previously about any problems with point 8?-- Well, after we had finished the test I discussed it with Mick Caddell and I said point 8 is reading 29, and Mick said, "Oh, well, that read that last time."

Did he?-- Well, that's what he said, so I was unaware of that.

You hadn't run into any problems with him previously

yourself?-- No.

Just have a look at those sheets behind there. I don't think any of those are actually in your handwriting; is that right - that's still in 11A I'm talking about?-- Mmm. No, that's correct.

So, it appears you weren't associated with any of the span gas testing on those previous occasions?-- That is correct.

That are mentioned there?-- That's correct.

Or if you were, you at least weren't writing them up?-- I could have been underground introducing the tests, but not writing them.

It was the electricians' job to then attend to any repairs that had to be made to the tube - the tube bundle system; is that so?-- Yes, well, we did the repairs on them, yes.

Had you ever been part of a team that had been asked to do any work on monitor point 8 at any time?-- No.

That you can recall?-- No, not that I recall.

Just put that 11A then to one side and come back to 127. You will see if you go up towards the top of that document that there are a series of alarms registered there, all for 27 July, and we have been told that that's the date that this new system was set up, so it would seem that those alarms are somehow associated with the setting up on that date. That's the first five. You will see then there are a series of alarms in respect of point 16; one on 2 August?-- Mmm.

And that's an alarm on carbon monoxide in the 512 top return. Now, did you - you will see that it occurred at about 6.01 on the morning of 2 August. It wasn't reset - or wasn't acknowledged, I should say, until 9.54 that morning. What time do you start each day?-- Well, at that particular time I was doing - we were doing three shift rotation, so the week prior to the disaster I was on night shift.

On night shift?-- Yeah.

So, what time would you finish?-- 7 a.m.

Do you recall whether there was any alarm and/or siren on that Tuesday morning, or the morning of Tuesday, 2 August - that week-----?-- No.

-----that you had to react to?-- No, because - I possibly could have been underground.

You don't-----?-- I can't recall that.

If you had been on the surface that morning and been aware of that alarm, is that something you would remember?-- Possibly. It is hard to say, really. I'm not sure whether I would now.

I'm just trying to get an idea as to how often the siren goes off?-- Yeah.

Is it something that stands out in your memory if the siren goes off?-- Well, the thing with the siren is it is hooked up to numerous other things, like low air, all this sort of thing, so-----

Can I ask you this: are you able to say whether or not you did accept that alarm on the morning of 2 August?-- No, I do not.

The next day, 3 August, you would have still been on night shift?-- Yeah.

5 August you would have been on night shift?-- Yeah, I finished on the Thursday morning.

Well, 5 August is the Friday. You will see-----?-- I wasn't at work.

You weren't at work on the Friday?-- No.

You came in on the Saturday morning at what time?-- Starting at 7 a.m.

Okay. Now, you will see on the Saturday morning, 6 August, there is an alarm at 7.49 - that's about 10 to 8 in the morning?-- Yes, Saturday morning, yeah.

Do you remember whether a siren went off at that time?-- I was underground.

You were underground?-- Yeah.

You would have come in and gone underground that morning?-- Yeah.

Okay. In relation to what we will call the "acknowledgement of an alarm", we will talk about it in terms of setting the alarm by pressing the button on the Con Log and stopping the siren, acknowledging the alarm by going through the procedure on the Unor screen-----?-- Yes.

-----as a second stage - which it appears is the stage that's registered, you see, in that column there on Exhibit 127 - then if you wanted to change the set point value, what would you do after you have actually acknowledged the alarm?-- To change a set point I would notify an undermanager or a deputy.

And assuming that they agreed that there needed to be a change in the set point value, what would you do physically in relation to the system?-- Well, I'd set the machine to alter the set point on their instruction, but-----

Can you just explain what you would do? We have heard about the screen and the way it is set up. Just explain that phase of it. You have pressed "okay"?-- Yeah.

You have used your mouse; you have indicated "okay", and the alarm is accepted?-- Yeah.

"Acknowledged", I should say - acknowledged, I am talking about?-- Yes.

What would you do then to change the set point value?-- Press "change", and that brings up points, and you put in the number of the point, and then I think it brings up "low" - yeah, "low setting", and then you type that in and then next one will bring up "high setting", you type that in and, you know, then you hit "return" and you go back to a normal screen.

And you-----?-- I may have dropped a step, I don't know, but that's as far as I can remember.

And your new set point values are registered in there?-- Yes.

Now, if you wanted to leave the set point values the same but you still wanted to have an alarm if the gas high 1 - that's the low level alarm level - is breached, what would you do to achieve that?-- As I say, I don't know a great deal about this machine. I only know what I've been shown on the machine. I don't know what the low and high even means, you know.

You have just described that procedure that you go through?-- Yeah, that's on instruction just to do it.

Are you able to answer that question, though, or are you saying you don't know what you do - if you wanted to acknowledge the alarm, leave the set point values the same - that is your low and your high the same - but you still wanted to be aware if the gas levels breached the lower level on the next pass, or on any pass in the future?-- No, I'm not sure.

You don't know what you do?-- No.

Tell me, apart from when you were doing the span gas testing, if you were there on shift at the mine would it be unusual for you to either go in or be called into the monitor room to acknowledge an alarm on the Unor system?-- Well, if there was no, like undermanager or deputy available, I suppose they could call us to come over to have a look, yeah.

Did it happen though?-- No, not as far as I know.

You can't remember it happening?-- No, I can't remember anything like that, no.

So as a matter of course, the only association you really had with this system is when you were doing the span gas testing?-- Yes, that's correct.

And apart from that you didn't really have anything else to do with it. You say you could have, you could have been asked in, but you didn't really have anything else to do with it?-- That's correct.

Thank you, Your Worship.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Pearse, just one matter. You were involved in the span gas testing of the tube bundle system; is that so?-- That's correct.

And that would establish whether or not the tube bundle system was working adequately?-- Yes, correct.

On the surface there are analysers in the Maihak or Unor system, weren't there?-- Yes.

And they would measure the concentration of various gases that they were designed to cope with?-- Yes, correct.

Do you know if they were checked for their accuracy, those analysers?-- What do you mean? Calibrated?

Yes?-- Yes, they are calibrated.

What did you know about that?-- Nothing. I can honestly say, because the calibration was either done by Maihak or either Max or someone like that done the calibration.

Do you know whether Max - that's Max Robertson you are referring to?-- That's correct.

Do you know whether he in fact was in the habit of calibrating himself those analysers?-- I'm not sure really. No, I can't answer it directly.

You don't know?-- No.

You had no involvement with it yourself?-- No.

Your involvement was limited to the span gas -----?-- To the testing of the bundles, yes.

Thank you.

CROSS-EXAMINATION:

MR MARTIN: At any time either before or after 27 July 1994 did you see any manual or brochure in relation to the Unor system old or new?-- I just can't understand your question.

There was a change in the system late in July 1994, wasn't there, in terms of computer or don't you know that?-- No, I don't know, but -----

Simply then, at any time have you seen a manual or a brochure relating to the operation of the Unor system or Maihak system?-- No, I haven't.

There was a gas chromatograph, wasn't there, in the instrument room or the Unor room?-- Yes, that's correct.

Did you ever see any manual or brochure or any written material in relation to that?-- No, I didn't.

Could I just take you, please, to Sunday, 7 August. You came on shift about 7 a.m., was it?-- That's correct.

Was Mr Graham still there or had he gone or do you remember?-- No, I can't recall.

When you came on shift - I don't want to know in detail - but when did you first go to the instrument or Unor room?-- Possibly about 7.45, something like that.

Can I just ask you to accept for the moment that there was an alarm on point 5, 512 seals, at 7.15 and a few seconds which was accepted very quickly after that, within approximately a minute and a half or something like that. Who would have accepted that? Do you have any idea?-- No, I wouldn't know.

When did you first see Mr Squires that day?-- Well, from my first visit to the instrument room, around quarter to eight, say.

But not before?-- No, not before.

Was that the occasion when Mr Squires asked you to keep the 512, point 5 up on the screen?-- Yes, that's correct.

What time did you leave the instrument room having completed your duties there on span gas, approximately?-- Well, the

last one come through at 12.36. Possibly just around - after one o'clock - about quarter to one, say.

If we look at that you - do you still have Exhibit 117 there, that's the log?-- Yeah.

127, I'm sorry. Do you see there was an alarm - or appears to have been an alarm at 12.34 which was accepted very quickly. That was when you were there obviously?-- Mmm.

What about the next one on 512 seals, point 5, 12.47? Would you have been gone then?-- 12.47, no.

You would still be there, you think?-- Yeah, possibly.

You might have accepted that one - or acknowledged?-- I'm not sure. No, I don't know.

Was it your practice to reset the alarm - sorry, reset the siren whenever the siren sounded?-- Well, it wasn't my practice, but anyone could do it.

No, I mean when you acknowledged an alarm on a span gas did you always reset it?-- Yes, definitely.

Can you recall occasions in the past before 512 panel where you, at the direction of one of the managerial people, paced the final monitor point behind a seal or behind an area to be sealed? Do you recall any prior occasion except 512?-- Possibly could have been involved in 511, possibly.

I only want to know your recollection I don't want you to surmise?-- No.

When you finished the span gas - or indeed that test on 7 August, could you have been sent underground?-- Could I have been sent underground?

Yes?-- Possible to go underground, yes.

Were you told anything by Mr Squires about any of the conditions which had preceded the actual sealing of 512?-- No.

During the course of your presence on 7 August in the Unor room did you make observations in relation to the carbon monoxide parts per million rising?-- Yes, I did.

I don't want to go to a document and put it to you laboriously; what can you say generally about the rise in parts per million on that morning?-- Well, when Michael come in to see me a couple of times I just said to him - I said, "By gee, that's going up quick, that CO.", and his comment was, "Well, that's normal for a sealed section."

Do I understand you to say that apart from what Mr Robertson showed you about how to go through the span gas testing, other than that you had no training on the Unor?-- This is correct.

And no retraining at any time? Obviously if you have no

training you have no retraining, I suppose?-- No.

Does the same apply, I suppose, in respect to the gas chromatograph?-- I've never been shown how to operate the chromatograph.

Who was your immediate superior?-- My immediate superior?

Yes?-- Max Robertson or Dennis Evans.

Other than those two people, from whom did you have to take directions or who did you have to obey?-- Undermanagers and
---

Thank you.

CROSS-EXAMINATION:

MR MORRISON: Mr Pearse, you mentioned that when you got to work on the Sunday, that's the day that the incident happened, you heard that the 512 Panel had been sealed?-- Yes, this is correct.

You hadn't heard that until you arrived?-- No.

That's not a particularly surprising thing, people don't go around calling electricians to tell them that seals are going on when the electricians aren't there, do they?-- No, that's correct.

Did you hear it from Squires or from someone else perhaps?-- Well, it could be anyone really, just someone talking and said "512's been sealed."

What else was said about 512?-- No, well, I can't recollect anyone saying anything specifically.

Would you have been near the start point for this sort of conversation to occur, not back in the workshop?-- No, it was outside the bath house.

That's pretty close to where the start point is?-- That's correct.

There would have been a number of people milling around there ready for start of shift?-- That's correct.

Underground crews getting organised to go down - or at least some underground personnel getting ready to go down?-- Yes.

Did you speak to any deputies there at that point can you recall? Perhaps Len Graham?-- No, I can't - no.

John Blyton?-- No, not that - I can't remember really speaking to personnel.

Mick Caddell?-- No.

Was there any general talk going on about 512, any of its features, why it had been sealed, that sort of thing?-- Not that I can recollect.

You obviously spoke to him because you were setting up the span tests?-- That's right, yeah.

Did he tell you anything about the circumstances in which the panel had been sealed?-- No.

Or did he tell you anything about what he had observed or not observed or experienced down there himself?-- No, he hadn't - he never spoke anything to me.

Obviously at that point you were arranging with Mick Caddell that - just reaffirming perhaps that you would stay on the screen and he would go down the pit with someone else?-- Yes. See, normally a deputy went down.

I am perhaps not making myself clear. It wasn't prearranged that it would be Mick Caddell, you didn't have that arrangement ahead of time, that would have been something that was arranged on the day?-- That's correct.

As you say it could have been any deputy?-- It could have been any deputy.

When you were organising with Caddell then, or he with you that he would go down the pit with another miner and you would stay on the screen, nothing was said at that stage by him?-- No.

At all?-- No.

About the conditions in 512?-- No, nothing was said to me.

You must have been at that point at the start point or moving into the Unor room in order to sit on the screen?-- I was, yes.

And so naturally enough you would look at the screen to see what was on it?-- Yes, yes.

And almost certainly so did Caddell?-- No, well - I didn't make any comments to Mick Caddell about anything there like that.

No, no, I understand that you didn't. What I'm saying is it's almost certain that Mick Caddell saw the screen with you. About the same time as you were there at the screen he was too?-- Yes, yes, righto.

And in its normal mode the screen shows all the points that its currently sampling and analysing?-- Yes.

And samples all points all the time, doesn't it?-- Yes.

It just analyses in a sequence?-- Yes.

If you leave a point off the screen it's still being sampled, it's just not being analysed?-- Yes.

There was no need, I take it, to go through with Mick Caddell chapter and verse about what was going to happen over the span tests?-- No.

It was a fairly usual procedure?-- Yes.

One that you were familiar with?-- Yes.

One that he was familiar with?-- Yes.

Followed the normal procedure for span testing?-- That's right.

Not the sort of thing you need great long screeds of written instructions about, is it?-- No, no.

In terms of the sequence that was to be followed you didn't even have to sort that out, that was already done on the piece of paper?-- I just can't understand what you mean.

You didn't sit down with Mick Caddell to say, "Okay, now listen, Mick. I reckon you ought to go and do number nine and number three and number one because they are close to one another, and after you've done those give me a buzz from dip two boot and go down to this other one and can you...", you didn't have to do that sort of thing?-- No, Mick Caddell told me which way he was going.

The sequence was already organised?-- Yeah.

It's a perfectly logical sequence because it depends upon points being in proximity to one another?-- Correct.

At the end of each sequence of having put some spans in, usually does the deputy ring up to you and say, "Righto, I've finished there and I'm heading over to such and such place."?-- No.

You don't get any calls from the pit at all?-- No.

You just sit there and -----?-- I just rely on alarms and testing when it comes up.

Is it the case then that when you get - if you've got three points up you wait until the third one has hit the span by alarming, and then having recorded their values you dump them off and put the next three up?-- No, as soon as a point becomes active and I accept that alarm and reset the siren I take that point off the screen and put another one up.

The next one in the sequence?-- Yeah, yeah.

I understand now. Did I understand your evidence to be that

you deliberately kept the siren in its audible mode during this test procedure?-- Correct.

So it was a conscious decision on your part to keep resetting at the Con Log to make sure that the siren would sound?-- Yes.

So are you telling me that the siren, if you followed your course of conduct which you've told us about, would have sounded on each occasion of the span tests?-- Except point 18 and set point 5 because by the time that test was done it was well in excess of 44 parts.

Let's come back to those, but you are saying that's two points right at the end; is that right?-- 5 and 18.

You say that there wasn't a siren for them?-- Well, no.

How do you account for that?-- Well, point 18, I didn't get a reading up from point 18.

Sorry. I now understand you. Yes, I understand what you are saying. And point 5?-- Point 5 was 49 ppm when I started at around 8.30, 8.35 so the set point on point 5 would have been in excess of whatever. So I would not have got a siren on 44 ppm on point 5.

I think I understand. Well, you did test the 512 seals line, didn't you?-- Yes.

With a CO span?-- Yes.

And it came through, didn't it?-- Yes.

And are you saying then that that was not accompanied by an audible siren?-- No.

I am misleading you, I'm sure - or I'm confusing you. Are you saying there was a siren or wasn't?-- No, there was not a siren on point 5 when I did the test.

That's because - yes, I see. The set level was already up and you could tell the level of the span anyway?-- Yes.

I understand that. Finally I understand. All the time that people were down on that Sunday day shift, for quite some hours was there anybody, be it miner, be it deputy, be it electrician or welder or anyone else who was making any comment that it was either unsafe to be down or that as a matter of practice or principle people shouldn't be down? Did anybody suggest anything of the sort?-- No, sir.

It never occurred to you that either of those things was

right, did it?-- Well, I was conversant with Michael Squires and he said it was normal practice to seal a section - CO was going up, it was a normal thing for a sealed section.

Your 18 years-odd experience at mines didn't lead you to any different conclusion, did it?-- No.

And getting back to the question I asked then, it's correct to say, isn't it, that you didn't form the view that it was unsafe to be down the pit?-- No, I didn't form any view.

Nor did you form the view at any time that as a matter of practice or policy people shouldn't be down the pit?-- No.

Now, you mentioned that on the Friday you had worked the previous day, Saturday day shift?-- Yes.

And on that day you had yourself performed work on shifting the monitor point into the belt road?-- That's correct.

And two other electricians had already started that job?-- Yes.

And who were they?-- Clifford Kehl and John Hearne.

So, they had run some part of the line in there?-- That's correct.

Under instructions from somebody obviously?-- Obviously.

Not the sort of thing that an electrician would do off his own bat?-- Oh, no.

There is an accepted and acknowledged procedure in relation to those monitor points, aren't there, for sealed panels?-- Yes.

And you don't need it written down for everybody to know about it, do you?-- No.

And you would wait for instructions either from an undermanager or manager and perhaps in some circumstances a deputy in relation to where they would be positioned?-- Exactly.

And I presume this is something you have done before in relation to some of the other sealings at 512 - No 2?-- Yes.

And on many of those there was just one monitor point put in behind the seals, isn't that right?-- Yes.

That was not an unusual thing at all?-- As far as I know, no, you just put one point in behind.

So that when you did your work on the one in the belt road, it did not occur to you that something else should be done with the other one?-- No.

Nor did you suggest to anybody -----?-- No.

----- that something else should be done?-- No.

Now, you mentioned that there was - you had at that stage no indication of when it was to be sealed, you had simply been asked to do it; you remember that?-- Yes.

Though, clearly enough it was to be sealed soon if you were doing that preparatory work?-- That's right.

And there was other preparatory work going on as well, wasn't there? Belts were being pulled out, machinery was being moved?-- Yes.

All the normal work that would lead up to a normal sealing?-- Yes.

Now, can I take you to Exhibit 127 again? Do you still have that, the log?-- Yes.

I just want to ask you some things about that. Now, you were mentioning that you worked night shift up to -----?-- Thursday morning I finished.

That was the last night shift for that sequence?-- Yes.

And again on the Friday did you work?-- No, that was my rostered day off.

And then on the Saturday you came in and switched shifts to day shift?-- Yes, I come in.

Going back then to the sequence of points that Mr Clair took you to, those five for point 16 at the top of the page, the first one being 2 August, that particular one does span a time when you were at the mine; is that right?-- Whereabouts are you on the page?

I am sorry, I will make it clearer. As you go down the list of points, there is one for 2 August at 6.01 in the morning. It's about six down. 16, 512 top return, it's the first one -----?-- On the 2nd.

2 August?-- Yes.

6.01 a.m.?-- Yes.

There is no question you were at the mine at that time?-- Yes, that's correct.

And in the next period of time would have been - if you had been underground - would have been on the surface ready to go home?-- Yes, 7 o'clock I finished work.

Now, it may be that you can't remember day by day and blow by blow where you were, but are you able to say anything about where you were on Tuesday the 2nd at that hour of the morning?-- No, really I'm not -----

When you came up would you routinely go and check the Unor room before you went and got changed to go home?-- No.

Would you not actually go there unless someone asked you to?-- That's right.

I understand. Now, the next one is one where, because of your shifts, you wouldn't have been at the mine; is that right?-- Which is that one? That's at -----

3 August, 11 in the morning?-- No, I wouldn't have been there.

And likewise, the next one, 5 August?-- That's correct.

And then 6 August, which is Saturday, 7.49 a.m., you certainly were there for that?-- Yes.

And did I understand you correctly to say that that is one that you probably accepted and acknowledged?-- 7.49? No, I'm not sure if I did, no.

Well, was there any other electrician there on that Saturday morning working at the Unor screen?-- Sorry, sorry, can I go back to that 7.49? I was underground, yes, and there was two other electricians. One was with me, he was working on a different job, and we had another service electrician but he was up on the overland belts. He was working on the overland belts.

So, all the electricians were either at another place in the underground or down the pit?-- That's correct.

Now, the next one, again Saturday, 8.20 in the evening. You had gone by then, I assume, if you were working day shift?-- Yes.

Now, we come then to Sunday, 7 August, and you certainly would have been there and manning your post by 7.15 in the morning, the one that Mr Martin asked you about?-- 7.15?

Yes?-- Well, I was at work, yes, but -----

Well, Sunday you were doing the span tests?-- Sunday, yes.

Sunday, 7 August?-- Yeah, that's correct.

Doing the span tests, no question of you going underground, you would be on the surface?-- That's right.

Then 7.15 we see an alarm came in and was acknowledged a minute or so later, whatever. Was that you?-- I don't think so because, as I say, I didn't start my tests - I don't think I was over there that early. No, I didn't go over to the Unor room till about - what time did I say - about 7.30 or quarter to 8, I think it was, by the time I got over there.

Well, you were certainly over there at the start of the shift

because you were talking to Mick Caddell before he went down?-- Yes, that was about the time that we did do the thing, it was about 7.30, quarter to 8, yeah.

So, you think not that one?-- Yeah.

Well, certainly the next one is definitely you, isn't it, 8.25 on Sunday morning? You would have been there by 8.25, no question?-- Yes.

Would you accept that?-- Yeah, possibly, yeah, I'd say I would have.

We can see, if you just look down there, within 20 minutes of that the first of the spans comes in. The very next one, 8.48, is the first of the spans coming in?-- 8.48, yes.

You see that?-- Yeah.

So, at 8.25, the one that I am talking about for point 5, 512 seals, that's almost certainly you who accepted and acknowledged that alarm, isn't that right?-- Yes.

And as you look at that, it was at point 5 for 512 seals, gas high 1 on CO, set point at that time of 60?-- Yes.

You see that?-- Yes.

Did you change the set point level at that time?-- On - well, on instructions from Michael I did, yes.

What did you change it to, can you recall?-- No, no, I can't recall. Michael give me a figure and I put it in. I can't recall the exact figures.

Well, you put in the number 22 there as your acknowledgment number, or an acknowledgment number; you see that?-- Oh, yes, at the end there, yeah.

Now, there is no question you put that figure 22 in; there?-- Yeah.

Now, did the siren go off for that alarm, 8.25 in the morning, siren audible?-- Yes.

When you changed the set points, did you reset so the siren would stay on?-- Yes.

Is there a chance you might have left it off?-- No.

Do you know if electricians sometimes do that when they are running span tests, rather than have the siren continually going off audibly, leave it off?-- Oh, no, it was common practice to reset that siren.

Thank you. Now, the next one then is the first span that comes in for point 19 at 8.48; do you see that?-- Yes.

That's you who put in that acknowledgment and that number,

number 12?-- Yes, correct.

No significance to the 12, it was obviously just an easy number to hit?-- Well, with that mouse we had to operate it with, whatever the cursor was on was your first figure. It was easy enough to use.

I understand that. The next points then in order: 19, 3, 4, 8, 9 and 1 are all span tests, aren't they?-- Yes, correct.

And on each occasion it's you who accepted the alarm and entered the figures in the right-hand column which are either 12 or 15 as your designation?-- Yes.

Now, are you telling us that on each of those occasions the alarm was sounding?-- Correct.

Then the next in sequence is for point 5, this time a methane alarm at 9.49 in the morning. You accepted and acknowledged and entered the figure 12. Is all of that correct?-- Yes, after I notified Lex, yeah. That's the one I went and grabbed the deputy for.

Well, no, just be careful. I am talking about point 5, not point 18?-- Oh, sorry, yes, sorry, 5. No, I'm not sure about that.

You are not sure what?-- That I accepted that one, 9.49.

Well, if you glance down about six or eight lines you will see that there are still span tests to come in?-- Yes.

And they come in at 12.24 and 12.26 and 12.34. It's almost certain you were still there?-- Yeah, sorry, I'm with you now, yeah.

You entered 12 again as your number?-- Yeah.

Did you change the set points on that number at that time?-- Well, on instructions from Michael, yes, I would have.

At some stage in that process you asked for - or he asked for point 5 to be kept on the screen?-- That's correct.

With the result that it was being monitored three times faster than it normally would be - I am sorry, three times more frequently?-- Yes, more frequently.

Now, the next two points are the ones for point 18 that you told us about at 10.04 and 10.47. Now, did you get a siren at the 10.04 one or not?-- Well, as I have stated to Mr Clair, I'm not sure. I know one of them I would have.

Well, you said, I think, in answer to him that you had one in the morning and one after lunch and they were the two that you reset?-- Yeah, that's correct.

You were talking about point 18, were you?-- Yes, yes.

So, your memory tells you there were only two occasions for point 18 where you actually reset?-- That's correct.

Not four or five?-- No.

Well, one or other of these then produced the siren?-- That's correct.

And if you had followed your pattern, from what you say, you would have reset after the point 5 alarm at 9.49, isn't that right?-- Yes.

So that the next alarm, point 18, would have produced a siren?-- Yes. I see what you mean, yeah.

If you had reset after that, that is, hit the Con Log reset button, the next one would have sirened again too, wouldn't it?-- Well, I'm not sure really. It should have. I suppose it should have, yeah. I'm not sure if it did. I can only recall hearing one siren.

One siren for point 18 you mean or one siren overall?-- No, no, one siren for point 18 at that particular time.

Each of those was gas high 2. That's the upper level set point, isn't it?-- Yeah.

And each of those was inexplicable in terms of any span test because (1) you weren't doing CH4?-- That's correct, yeah.

And, secondly, you had no ready explanation for why point 18 would suddenly pop up with four and a half per cent methane?-- No.

And Henderson's only explanation was that Bob Newton was draining the methane range?-- That's correct.

Did you ask Henderson - I am sorry, I will start again. You were conscious at that time, I take it, that there were time delays on each of these tubes?-- Yes.

You would have known that?-- Yes.

There are things you recorded?-- That's right.

And the time delay historically for point 18 was, what, nearly an hour?-- An hour, was it? I don't know.

Look at the previous sheet?-- Oh, sorry, 65 minutes.

About an hour?-- Yeah.

Did you ask Henderson anything about how he formed this view that it was Newton's activities causing the methane?-- No.

Did it occur to you - sorry?-- No, I just accepted his explanation.

And you must have been conscious then that he was relating

events an hour ago because you have just got the alarm, that sample entered an hour ago?-- No, I wasn't conscious at the time. I didn't think of it. I just accepted what Lex said and that was it.

Well, you didn't change the set point level for point 18, did you?-- No.

And in fact, just let me pause to ask you a general question. When you accept an alarm, by which I mean you hit the Con Log button to turn the siren off; that's what I call accept?-- Yes.

And then you acknowledge which is what you do on the screen?-- Yeah.

Routinely you don't have to change and routinely you probably don't change the set point levels, do you?-- No, only on request by a higher authority.

And usually the only such request that would come would be, as you say, from a higher authority, undermanager, maybe a deputy, in the context of a sealed panel most likely where the gas is going up?-- Obviously.

All right. Now, the next alarm then is point 5 again at 11.26 - I am sorry, I should just take you back one to the last - the second alarm for point 18 at 10.47. Now, you put in a different number this time, number 15. No particular reason for that?-- No, just come up.

Once you got the mouse on the number pad, why didn't you just click the one number twice, put in 11 or 88 or 66 or 77?-- I don't know.

Why bother going to 15?-- I don't know, I just moved it.

Interesting. Now, 512 seals at 11.26, you used the number 15 again. Did you reset the Con Log so that the alarm would be audibly reactivated?-- That's at 11.26, yes, yes. I heard the alarm, I reset the Con Log, yes.

You must have reset the set points, did you?-- If the alarm went off, yes, I would have.

This is the sealed panel where you know the CO is going up?-- Yes.

Unless you reset the set point -----?-- It's going to alarm.

----- it's going to give you another -----?-- Yeah, I called Michael in and showed him what it was and he said, "Take it up X amount.", I'm not sure how much.

Now, we then have two more alarms for point 18. This is an hour and a half roughly, I think, or two hours after the first alarms for point 18, and again exactly as before four and a half per cent methane roughly and no change in the set point levels, that is, the high set point level?-- Mmm.

Did you turn your mind to whether those set points should be changed?-- No, because, as I say, I was using carbon monoxide, not CH4.

Well, it was enough to call in Henderson to talk about?-- Yes, that's right, to show him what had happened again.

And you said you called in Henderson about the point 18's before?-- Yes.

Did you call in Squires?-- Well, I don't know where Michael was. He may not have been in the undermanager's office. I went and grabbed - I went and grabbed the first official I could.

He must have been around somewhere because sandwiched between those two occasions is the alarm at 80 points for point 5, 512 seals, and you said that you had his instructions at that point?-- Yeah, from Michael to raise it, yes.

Did you say he wasn't around before or after?-- Well, I can't recollect whether Michael was there, but I just went and grabbed the first official I could, and the logical place - I didn't see him in the undermanager's office, so I went straight around to the deputies' cabin.

Then we move into some different alarms. The next two following, that's for points 6 and 16, as you will see, are span gas alarms, aren't they?-- Yeah, that's at 12.24 you are talking about?

12.24 and 12.26?-- That's correct.

In each case accepted by you putting in the designation 12 and 15 in the right-hand column?-- That's correct, yes.

Now, then point 18 went off again as your very next alarm a few minutes later, and a mirror image of what had happened four times before?-- Mmm.

Did you get in Henderson again, or Squires, or anyone else, or did you just accept the alarm?-- As I said, I can only recollect two alarms. I don't - you know, I know you are saying 15 is in there, but it is a random number. I cannot even recall accepting that other alarm.

Well, you had been there seven minutes before doing the span tests?-- Yeah.

And there is more span tests to come - the very next alarm after the one we are discussing is a span test?-- At the top?

At 12.34?-- Yeah.

You were clearly enough there for that one?-- Mmm.

It is almost certain, isn't it, you were at the 12.33 alarm for point 18?-- But I can't recall it going off. As I said, I only recollect getting two alarms - the two I grabbed the deputy for and showed him.

All right. Well, you didn't leave the post, though, did you? You didn't go wandering off away from the Unor?-- I could have made a cup of coffee, or whatever, but I made sure if I did want a cup of coffee I had plenty of time to go and do it, but I can't say I walked out at that particular time, no.

But even if you had and the siren went off for point 18, you would have been back there in a flash because it might have been the next span coming through and you wouldn't know until you looked at it?-- That's right, until I looked at the screen.

All right. Well, 15 on this point through this day was not just a random number. I understand it is not a number of particular significance, but it is a number you had selected before more than once to enter into the acknowledgement column?-- By the look of it, 12, 15 and 16.

13 as well?-- Whatever, yeah. It was just a random number.

Now, I've just mentioned to you the next alarm which is for point 7, your span test?-- Mmm.

The next one is a 512 seals alarm again, this time on methane?-- Yes, 12.47.

That was the low level of methane. That's you, again, isn't it - you got that one - 12.50 you were still there?-- Yes.

Now, what time did you finish that day?-- Well, 3 o'clock was my finishing time.

After the span tests were over, did you leave the Unor and go off and do other things?-- Well-----

I want to know because you said you waited and waited and waited for point 18?-- I waited for point 18, which was 11 o'clock, and I waited longer than an hour, which is what you have shown me on this next sheet, which took it through to 12, so I was still there at 12.36 when point 7 come through at the bottom; so it would be around 1 o'clock or quarter to 1 when I left the Unor room.

In that sequence I've just taken you through, you will have seen that on five occasions point 18 went into alarm mode and had to be acknowledged by you on a CH4 gas high 2 alarm. In other words, it exceeded the upper limit each time; isn't that right?-- By this sheet, yes.

Do you have any memory, apart from what you might have read here, of what was going on on that day?-- I can only recollect accepting two alarms - the ones I notified the deputy on.

You would expect, wouldn't you, given what you see there and your own experience, that if 18 kept bringing in a return above the gas high 2 level, it would continue to signify an alarm? It has done it five times; no reason for it to do otherwise, is there?-- Mmm.

Is that right?-- Sorry, I didn't follow the question.

I will start again. You see five times point 18 has gone into alarm mode requiring you to accept it on the screen, and so forth, and each time on a gas high 2 methane alarm?-- Yeah.

The five that I took you to. Do you want me to go to them again?-- Mmm.

10.04, 10.47, 11.58 - sorry, am I going too fast?-- No, you're right.

12.22 and 12.33?-- Mmm.

Each one the mirror of the other?-- Mmm.

You would expect that if point 18 in that time was bringing in and analysing methane at 4 and a half per cent - that is, well above the top level - it would do exactly what is shown here; it would go into alarm mode and you would have to accept it and so forth; isn't that right?-- Yeah, well, it would go into alarm mode, yes.

Well, if it is the case that within those times - that is, within the times that I've just read out to you - point 18 was, in fact, analysing well above the gas high 2 level on methane, but it was not registering on this document at all, would that lead you to think there might be some difficulty with the registration system?-- Well, I can't follow this document really because, you know, it is showing alarms I've convinced myself that I did not receive.

Well, from what you say, you already doubt - or you in your

own mind have reason to doubt that this is an accurate document because it doesn't accord with your recollection at all?-- I can only go on what I can recollect, I'm afraid.

I understand that. That's what I'm trying to establish. So far as you are concerned, this really can't reflect accurately what happened?-- No, it really can't, hey.

You see, you may be right about it, Mr Pearse. I'm not fighting with you; don't imagine that I am - I'm really not?-- It has thrown me into confusion to see something like that.

It is very confusing. You see, if I take you back to those two points I was mentioning at 10.04 and 10.47, if you consider those two points - if at 10.15 and 10.26, so it is smack in the middle of that time, point 18 was actually analysing 4 and a half per cent methane still, you would expect it to come up on this log, wouldn't you - it has done it before - five times it has done it, one after the other. You would expect to see that, wouldn't you?-- But one thing I'm not conversant with - with this machine is - is if point 18, say, is not active, will it alarm? Like, will it register as an alarm if I didn't have it up on the screen, say? You know, I'm not conversant with that part of the machine.

I see. You are not sure about that?-- No.

Well, you can't give me an answer to the question effectively that I raise - that if point 18 is, in fact, bringing in and analysing methane levels well above the gas high 2 level within the times it is actually recorded, you can't explain how that could be so?-- No, I can't.

How it wouldn't register?-- That's right.

If it was doing that and not actually registering on this log, do you think an answer might be the software in the system was playing up, or the machinery was playing up?-- Could be. I can't give you a straight answer on it - yes or no.

Certainly if that's what I just suggested to you is correct, it may give added reason to doubt the accuracy of the log, in your view?-- Yes.

Can I just ask you this: you mentioned in relation to this sequence - and you were asked about Exhibit 11A, which you may still have with you - that there were two points showing difficulties - 18 and 8?-- That's correct.

And did I understand you rightly to say that you wrote a notation about point 18 in the electricians' shift report?-- That's correct.

Or the shift log, or whatever you want to call it?-- Yes.

So, a record was made of that, and the purpose of the record is to ensure steps were taken about it?-- I wrote point 18 had to be retested because I didn't get a reading up on it.

The purpose of that report is to ensure action is taken?-- Yes.

And point 8 didn't get a mention, but specifically because Caddell had assumed responsibility for himself?-- That's correct.

He was going to tell someone or do something?-- That's right.

So, in respect of each of the points that came up short of performance, they were either recorded or positively noted for further attention?-- Yes.

At the end of the sequence of span tests, you say in the statement that "all points were reactivated to normal". How does one go about doing that? Is it a question simply of bringing them back on the screen? Is that it?-- You had to put up each point individually on the screen and change it from - if it was active - you had to change it from inactive to active.

And is that all? You don't have to do set points or anything like that again?-- No, no.

So, the step to reactivate was simply to put them back active on the screen?-- That's right.

At the end of your shift, it is about 3 in the afternoon; is that correct?-- Is this on Sunday?

Yes?-- Yes.

Who was the electrician coming on to relieve you?-- Brian French.

Did you speak to him?-- Not that I can recall. I may not have seen him at the start of shift. I'm not sure.

Did you see Mr Blyton?-- No.

Did you see any of the on-coming shift members?-- I may have seen miners or someone, you know, just as we are changing shifts, yeah.

Well, of those coming on, did any person at that stage say to you, or in your presence, anything I have been discussing much earlier; that is, anything to do with the circumstances under which 512 was sealed, or that it was inappropriate to be down the pit, or that people shouldn't be down as a matter of policy or practice? None of those things?-- No.

Did you give any information to French about the alarms and the resetting that you had been doing?-- As I say, I can't recollect speaking to Brian. If I would have, I would have said, "I have just done the span gas tests." That's what I would have said to him.

There was another alarm before you went - that is to say, before you finished your shift - at 2.31. Have a look at

Exhibit 127. You will see that on 7 August, 2.31, point 5 for 512 seals, some oxygen alarm. Do you see that? Can you recall dealing with that?-- Whereabouts is it?

Sorry, if you run down the "time of alarm" column, do you see that?-- Yeah.

Down till you get to 7 August - there is a large number of those?-- Mmm.

About two-thirds of the way down the page you will see one for 14.31.33?-- Yeah, righto.

Now, it is 2.30 in the afternoon?-- Mmm.

You're still there, not down the pit. You have finished the span tests and so forth?-- Yes.

Did you deal with that alarm?-- Did I?

Yes?-- No.

How are you so sure about that?-- I was over at the workshop. After I finished my tests, I went over to the workshop to write in the report book what had to be done about point 18; so I was over the workshop.

Are you saying then that you heard that alarm go off audibly?-- I don't recollect it, no.

So, so far as you can recall, after you got back to your workshop from having done the span tests, you did not hear another siren?-- Not as far as I know, no.

Now, go back one line in the sequence. That was an alarm you dealt with - we talked about that before; isn't that right?-- That's at 12.47?

Yes, a matter of minutes after the last span test came through?-- Yes.

12.47 is one you dealt with, isn't it?-- Mmm, yeah, I'd say I probably have.

Let's just discuss this: if you didn't reset properly at the end of that, the siren wouldn't go, would it?-- If I didn't reset, but I made sure after every test I done - whatever - I always reset that siren.

I know you say that, but then at 2.30, the very next alarm up, you can't recall the siren going for that alarm, can you?-- As I say, I don't know where I was, no.

But you told us you were in the workshop writing up your report and so forth?-- Yeah, I would have been over the workshop.

No question you would have heard the siren in the workshop?-- Possibly.

Oh, come on, Mr Pearse-----?-- I heard 18 sirens all day. I think another one, you know-----

All right. Now, when the last span test was done, the reactivation of all points was the next step on the menu?-- Yes.

That wouldn't take very long, I take it - a matter of minutes?-- Yeah, minutes.

How do you account, if at all you can, for the fact that for 38 minutes point 5 wasn't being sampled at all?-- No, I can't account for that.

There is nothing you did which would result in that?-- No, no.

There must be then something that was done down the pit?-- I don't know.

Well, the machinery didn't stop, did it? The system kept going?-- Mmm.

We can tell that. All the other points were being sampled?-- Mmm.

Everything was operating normally. How could you account for that if suddenly point 8 dropped out of being sampled for 38 minutes? Is that the conduct of someone down the pit mucking around with the tubes?-- I doubt that. I couldn't see anyone messing up with something-----

I don't mean to say mischievously. If I gave that impression, I withdraw it. I didn't mean to convey that. I will rephrase it: someone doing work on a tube, breaking a coupling?-- Not that I recollect, no.

Did you have any understanding of where, when point 5 was sampled, the sample was introduced?-- Did I have the point?

Did you understand anything about where the sample for point 5 was introduced - in which part of the tube?-- Yes.

Who gave you that information?-- Well, when we - when we finished that point on Saturday, I knew where the joiner was outside the seals and I instructed Mick Caddell, well, "That will be the place to put the sample point in."

Outside the seals?-- Yeah.

You directed him where to go in that instance?-- Yeah, just in that one instance.

Can I just ask you one last thing if I may: I want you to run through now step by step the exercise for me. It doesn't matter what gas it is. If we get an alarm on the Unor screen and the siren goes off, okay, alarms now, what do you step by step to accept, acknowledge and reset?-- Right. Switch off the siren.

How?-- By pressing the button on the Con Log. Have a look at the screen to see what it is on the Unor. You have a Unor light up on the Con Log. You have a look at the screen to see what it is, and if it wasn't caused by me by doing a test, span gas test, then I would grab an official of the mine which is either a deputy or a manager and point out the fact of what the alarm was and then on his instructions reset the alarm and then reset the siren.

Sorry? You would grab the official?-- Yeah.

And then you would do what?-- Show him what the alarm was.

Yes?-- And then on his instruction reset the Unor.

I'm asking you to do step by step. You get told something by the official, what do you physically do then? You've shown him the alarm, Con Log has been hit, so the siren is off and the light is on?-- Yeah.

You get some information from the official, what do you physically do then?-- Say, "Well, is it okay to reset the Unor?", and it's up to him and. If he says, "Yes" I just reset the Unor.

How?-- By "alarm accept" and then by just putting in a random figure and then hitting "okay" and that will accept - that will reset the Unor and then reset the siren.

That's the sequence?-- Sorry?

That's the routine sequence?-- Yes.

As far as you know that's the routine sequence that all electricians would follow on this system?-- I can only speak for myself, but I would say yes.

I have nothing further, Your Worship.

CROSS-EXAMINATION:

MR HARRISON: Mr Pearse, if I can just take you back to Saturday?-- Yes.

You said that Michael told you to finish up moving the number 5 monitor point to the position it ended up behind the seals?-- That's correct.

And you said that a couple of electricians had already started that task the previous evening?-- Yes, correct.

What time did you finish that task?-- I can't give a time. I don't know really. Like it took a few hours - couple of hours to do.

Was it finished in the first half of the day shift or second half?-- Well, it was finished - I think it was finished before crib time, before 12 o'clock.

Have you been involved in the placing of monitor points behind sealed panels before or panels about to be sealed?-- Yes.

From your experience was it normally the case that there was one point placed behind the seals?-- That's - yeah, as far as I know, yes.

You've never seen situations where there have been two?-- Not that I recollect, no.

Have you ever been aware of any situations where for whatever reason there haven't been any?-- No, no, there is always put a point behind the seal.

Usually one there?-- Yes.

If I can just turn to Sunday, from what you've said earlier Michael spoke to you after Mick Caddell left to go down to start setting up the test points -----?-- Yes.

----- for the span gas testing, and he asked you to keep the 512 monitor point active on the screen; is that right?-- That's correct.

And he asked you to keep testing?-- That's correct.

You were able to organise that so that it tested every four minutes?-- Correct.

Was it the case that it was basically on the screen the whole time or would it come up every four minutes or so?-- No, it was set up on the screen, like you could see "510" written on the screen at all times.

Or "512"?-- "512" I mean.

More importantly point 5; is that what you would see?-- Point

5, yes.

Was it obvious to you at that stage that Michael was showing an interest in what the Unor was indicating about point 5?-- Yes.

He continued to display that interest right throughout the course of that shift, didn't he?-- Yes.

In fact when we look at what Mr Morrison just discussed with you - it will mean me taking you back to that alarm log briefly, I stress briefly - just correct me if I am wrong, you agreed with him that if you look at the entry for point 5 at 8.25 a.m., accepted 8.27 a.m. do you see that?-- Yes.

That's an alarm on point 5 for CO?-- Yes.

As I understood your evidence before you said that you would have accepted that alarm, acknowledged it on the screen, and you would have reset the points or the monitor points, if I can call them that, on advice from Michael?-- Yes, that's right.

So I take it you would have spoken to him at that stage about the CO level and the fact that it had alarmed?-- Yes.

I know you can't recall figures, but did Michael suggest to you that, "All right, reset it at a certain level."?-- Well, Michael told me what set points to put in.

Can you remember now what they were?-- No, I can't, I'm afraid.

Would it have been something along the lines of a further 10 to 20 over and above the previous set point?-- Yeah, possibly, yes.

Does that ring a bell?-- Yes, it could be about 10 to 20 - 10 - say 10 parts, yeah.

Now, again as I understood your evidence when Mr Morrison, the gentleman next to me, was questioning you, you agreed that much the same thing happened at 9.49 - with the alarm that went at 9.49 on point 5 for CH4. Do you see that?-- Yes, I see that.

So you would have spoken to Michael again about what to do in relation to CH4?-- Yes.

Now, the next one he took you to was 11.26, again at point 5, carbon monoxide?-- Yes.

Do you accept that you probably again reset the points -----?-- Yes.

----- in relation to that?-- Yes.

Again on instruction from Michael?-- On instruction from Michael, yes.

Now, the fourth one he took you to where I think, in fairness to you, you said you probably did it, was at 12.47 again for point 5 for CH4?-- Yes.

If you had been the one that reset the points - again I take it this would have been in consultation with Michael?-- Yes. Any altering of any set point was done in consultation with Michael Squires.

So assuming all that happened you would have spoken to him on at least those four occasions?-- Yes.

Possibly even spoken to him on more occasions than that in the course of that shift?-- Yes.

And it was obvious to you, was it not, at all times that he was interested in what information was coming up from monitor point 5?-- He was interested, yes.

It wasn't a case of him just totally ignoring what was coming up from point 5?-- No.

At one stage I think you said something to him like this, if I could read my scrawl: "Gee, that's going up quick, that CO.", and he said, "I think that's normal for a sealed section."?-- Yeah, that's what he said, yes.

Do you know roughly when that was that you had that conversation in the sequence of events?-- No, I can't really, I can't recall the times.

But in any event it would be fair to say that he spoke to you quite a few times in the course of your shift about what was happening behind the seals in 512?-- No, don't get me wrong, he didn't discuss what was happening behind, all he did was ask me - when I got an alarm I saw him and he said, "Well, that's gone up over the set point, could you raise the set point -----

You are quite right, I could have phrased that a lot better. He was quite interested in what information was coming up from point 5 which was the point behind the seals in 512?-- Yes, yeah.

Thank you. I have nothing further, Your Worship.

MR CLAIR: No further questions, Your Worship.

EXAMINATION:

MR PARKIN: Could you please look at Exhibit 127 again, please? I guess the question is: I would like to know why it took so long to acknowledge some alarms and, for example, if you look down at point 16 on 3 August - can you see that?-- Whereabouts?

Point 16 on 3 August, if you look down the time of alarm?-- 3 August?

Yes. You will see that the time of the alarm was 11.09 and the time it was acknowledged was 1905, that's approximately eight hours to accept an alarm. Can you see that?-- Yes, yes, I do.

And then there is another example there that we may as well look at, and that is on 6 August you will see that there is a time for an alarm - these are CO alarms - at 7.49 and the alarm is acknowledged at 1421, approximately seven hours later. Do you know why this would take so long to acknowledge an alarm?-- No, I don't. I don't, no. That was on the 6th - that's on 6 August, is it?

Yes, that's on 3 and 6 August respectively?-- No, no, I don't know.

Because I would assume from what you've described this afternoon most of these alarms on this log are accepted in what one would say is a reasonable time?-- Yes.

But there are a few exceptions and these are two of them?-- Mmm.

In your opinion - I mean how could that happen?-- Seven hours?

Someone has to be there to accept an alarm, don't they?-- That's quite right, yeah, but I can't account for seven hours. No, I can't see that -----

Would you have any idea as to why that was the case?-- No, I would not. That was on the Saturday, is it? Hang on, Saturday at 10 to eight and it was accepted at 2.21?

Yes, that's right?-- No, I can't explain that one.

You can't explain that?-- No, I can't.

You've got no idea?-- No, I haven't.

Thank you very much.

EXAMINATION:

PROF ROXBOROUGH: Mr Pearse, you've been responsible for testing the Maihak tubes since the system was installed; is that right?-- Yes.

Every month?-- No, well, not every month, no.

But probably no-one has done more testing than you; would that be right?-- I wouldn't - it's hard to say. Like over the period of time we have all sort of done something on it.

Do you know if there is an historical record of the faults that have from time to time been discovered in the Maihak system?-- Not that I'm aware of, no.

When you find a fault what do you do?-- Notify my superior.

You don't follow it up?-- Well, I have to notify him first to let him know that something has occurred, and on his instruction go and fix it or whatever.

How long can that take?-- It all depends on when they schedule the job for. It depends on - up to them. They make the decision on when the job is to be done.

So that part of the system it inactive until it's put right?-- Yes, yeah.

So when you find a fault you really don't know how long that fault has existed. If it's checked out once a month the fault could have existed for anything up to a month?-- Yes.

Can you give us any idea as to the frequency at which faults were found? Any idea? Would you describe the system as highly reliable or -----?-- Well, mainly faults were caused by roof falls and things like that, damaging tubes. Well - no, we never had a great deal of faults with the bundles themselves, no, not really.

So you would describe it as highly reliable?-- No, I wouldn't say highly reliable, but it was -----

Available 90 per cent of the time, 80 per cent of the time? Could you put a figure to it?-- Yeah, say, 70/80 per cent.

Thank you.

EXAMINATION:

MR ELLICOTT: On Sunday, 7 August, the span test for point 18 hadn't arrived by the time you left?-- That's correct.

I'm wondering what may have caused that. I suspect one possibility is a kinked tube resulting in a slow sample draw time or -----?-- It's possible, yeah.

Is another possibility a leaking tube?-- Really - possible leaking, yeah.

Would it be possible that the tube could be leaking enough to not pull the span gas through at all?-- Well - but then how do we account for the CH4 readings coming up through that point 18? So the tube must have been okay.

I think the tube must have been pulling something from somewhere?-- Yeah.

But that wasn't necessarily from the sampling point, was it?-- Well, I can't - yeah, I don't know.

I suspect it may not have even necessarily been in the 510 north return. Is that possible?-- It shouldn't be because the point was there.

But where did the span gas go?-- I don't know. I can't answer that, so it must have just - well, it's had to have a fault somewhere along the line for me not to get the sample up, yes.

And those two possible faults appear to be either a kinked tube or a leak, I would suggest?-- Yes.

If it's a kinked tube there is a long sample draw time?-- Yes.

Probably leaking as well if the span gas got there about 10 hours later and approximately 50 per cent diluted?-- Yeah.

Now, if that was the case, then at some point possibly nine per cent methane was pulled into the system which is a little disturbing?-- Very, very, very much.

Now, the other possibility is the four and a half per cent methane has been pulled into the system from some place unknown?-- Well, as I say, I can't specify on that.

Do you know the route that the line for point 18 took underground?-- Basically, yes.

Is it possible for you to indicate that on - I think you will find a map of the mine on the board if you turn it over. It may be best if you sit down and use the dancing red spot?-- Can I just have a look first?

Yeah, sure?-- Was it on this one or this one? As far as I can recollect the point was about - that's 512 - the point was up in there approximately, 18, and the tube come down to the supply road, run along, up - hang on. No, sorry, it come there, around this way and then joined and went up.

Sorry, could you describe "this way"?-- Sorry. That's the point 18 tube you are talking about, isn't it?

Yeah. Point 18 tube. I think I've just put us both out of our misery; I've been handed a plan with a route on it?-- Good.

Nothing further, thank you.

RE-EXAMINATION:

MR CLAIR: Mr Pearse, you mentioned, I think to Mr Harrison, in accordance with indications you gave earlier in your evidence that Mr Squires was there in the - at least you got directions from Mr Squires during the course of the morning of the 7th in relation to resetting the alarm points upwards for various items?-- Yes, correct.

Did Mr Squires come to the Unor room on those occasions or did you go to see him?-- When I got the alarm I went and grabbed him straight away to bring him in to see it.

And he did come into the Unor room?-- Yes, yes.

Are you able to say whether he stayed there for any length of time or whether he left straight away? In other words were there periods of time when he was in the Unor room too during that morning?-- Well, yeah, he would come in to have a look at the screen on the odd occasion. Like he didn't just come in because of a siren or go out of -----

Apart from when you might have gone to get him because of the siren he also came to the room on occasions too?-- Yes.

On those occasions when he was there did he stay long?-- Just for a minute or so just to have a look at the screen.

Were there times when you slipped away from the room or were

you there during the whole of the period of that span gas testing?-- No, I went outside - just outside the door there to make a cup of coffee and come back in again.

And were there times perhaps when he was there and you weren't?-- It's possible because his office is adjoining the instrument room.

Were there times when there might have been other persons there in the Unor room, either when you were there or when you weren't there apart from Mr Squires?-- Not that I can recollect, no.

Is there scope for Mr Squires to have accepted any of these alarms while he was there?-- Well, the siren would have went off and I would have come back in straight away.

You would have come back in under those circumstances?-- Yes.

Well, in accordance with what you do recollect then, were there times when the siren went off that Mr Squires was there? I mean, some of these alarms were accepted pretty quickly, it appears?-- Mmm. As far as accepting, I have only got - sitting here, I have only got to take one step and reset.

Yes, I know, but apart from the alarms associated with the span gas testing, according to what you have told us, every time an alarm came in, you left the room and went and spoke with someone before you actually acknowledged the alarm on the Unor?-- If it was anything bar what I was doing on my span gas test, yes.

What I am saying to you is that there appear to be some of those alarms, that is, not the span gas test alarms, but the other alarms which were accepted fairly promptly, sometimes within 30 seconds, I think we have seen on a couple of those occasions, or 40 seconds. I am just asking you whether it is feasible that there was somebody else in the room, Mr Squires or anybody else, who might have accepted the alarm and acknowledged it fairly quickly, or you perhaps accepted the alarm and if he was there he might have acknowledged it?-- I can't say it's not possible, but it is possible.

I have nothing further, Your Worship.

MR MORRISON: Your Worship, I do want to take a couple of minutes with him just to finalise this. I don't want him to go away thinking that I have not given him ample opportunity.

FURTHER CROSS-EXAMINATION:

MR MORRISON: Now, I need you to look at a couple of documents, Mr Pearse, and, firstly, you will need the second - volume 1 of the SIMTARS material. I will just ask you to look at this document. This is the record of the recorded values for each of the points down the mine. Now, I have opened it at page 21 in Appendix 2.1.7D which records the recorded values for point 5, 512 seals. What I just said to you is correct, isn't it?-- Yes.

It's open at 21. Now, can I direct your attention to a line about, say, 15 points up from the bottom? They are all 7 August, this page. I want you to look for 8.56.09 in the morning?-- Yes, right.

Do you have that?-- Yes.

And then the next one after that should be 9.32 in the morning?-- Yes.

When we look at that, it's obvious, isn't it, that for 36 minutes no samples were being recorded for point 5, were they?-- Yeah, by that, yeah.

Now, this is not something that can be done down the mine by people dismantling tubes or anything because if they do that it will suck atmosphere from a different part of the mine; in the worst case scenario it will suck fresh air?-- Yes.

So, that's not something that Caddell did. Quite apart from the fact I have just mentioned, he wasn't even at that point at that time, he was busy putting in spans in the first or second sequence?-- Mmm.

Now, this is after the first span test arrived and you were sitting at the screen and Michael Squires had asked you to put 512 up and you had it up?-- Yeah.

How do you account for that?-- Well, as I said, I had point 5 up on there and it was going through - being sampled every four to five minutes.

Clearly it wasn't, was it?-- Well, I can only go on what I can see on the screen in front of me.

So, the screen told you it was being sampled, but as it turns out, on that basis, the recording is faulty?-- Well, I can only go on what I saw and what I was asked to do.

Well, turn the page and I want you to look down about 20 points from the top, still 7 August, you are still there at the screen. I want you to look for 12.04.34?-- Mmm.

You will see that the CO drops from 84 parts to 17?-- Yes.

Now, it's been running at about 80?-- Yeah.

Drops to 17 and then the next reading at 12.09 is 44. The 44 is clearly the span, isn't it?-- That's correct.

And the 17 before that is dilution?-- Yes.

Which would be consistent with, say, Caddell breaking the line?-- Yes.

Getting ready to insert the gas and he is picking up a bit of general body atmosphere?-- Yes, correct.

Well, 12.47 is when it goes back to its next reading, 38 minutes later, it's done it again, hasn't it?-- Yes.

The absence of a sample can't be anything that Caddell was doing, he would get dilution?-- That's right.

Well, do you say that in that 38 minutes you were seeing anything on the screen for point 5, bearing in mind you had been asked to keep it on the screen and did so?-- Yes, I did. As soon as he asked - when he asked me to put it up, I kept it up at all times.

So, this may be another instance where the recording of the information by the software or the machinery doesn't match the reality?-- Well, I can only go on what I saw in front of me, and I kept it up there and that was it. I don't know anything about this.

This didn't match what you saw, according to what you say?-- That's right.

Well, can you think of any explanation, absent some sort of software or machinery problem, which would account for those two periods of 38-odd minutes?-- No, I cannot really because, as I said, when Mick - when I got my samples through, well point 5 was still on the screen because it alarmed and I got - no, sorry, it didn't alarm because of the high set point, right? You go back to where that was, right? No, I can't say why the big time difference because point 5 was on the screen at all times.

According to you, this doesn't accord at all with what you saw on the screen. It was still showing samples for point 5 during these two periods; is that right?-- Yes, yes.

Okay. Turn over to the next tag, please, which should be page 21 of Appendix 2.1.7K, the recorded values for point 18 in the 510 north return. Do you see that?-- Yes.

Now, you will probably need to keep next to you Exhibit 127. I asked you before in relation to - if you look at Exhibit 127, the set of five readings for point 18 that came in all pushing out - sucking in, I should say - methane more than double the high point set level?-- Yes.

Now, the first one was at 10.04, wasn't it? Do you see a time that would coincide with that on page 21, a little over

halfway down the page?-- Yeah, 10:04:26 you said, was it?

10:04:26, that's right. Look in the right-hand column for the methane?-- Yes.

You see it's been running at zero point something or other for quite a while and then suddenly bangs in at 4.55?-- Yes.

You have found that?-- Yes.

That's the alarm you got?-- Yes.

You didn't raise the set point, we know that?-- No.

Then the next one to come in was at 10.47, the next alarm that was recorded, but let's look down that page of the SIMTARS documents. You see there at 10.15 in it came again at four and a half per cent?-- Yes.

And at 10.20 in it came again at four and a half per cent, then at 10.31, 10.36, and none of those that I have just read to you generated a record as an alarm, yet in each case it's miles above the gas high 2 level. Well, how do you account for that?-- As I said, I can only go on what I have seen and what I have done. I can't - I have never seen this before. I don't know what this is all about.

I accept you haven't seen it before, but accept for the moment that it is the record, so we are told, of the recorded values. You can't account for that, and yet the next one at 10.47 is the next alarm. That's the one that did alarm, the 4.59. Have you found that in the right-hand column?-- Yes.

And yet between 10.04 and 10.47 you have got four or five readings that have clearly come through on the analyser but not generated any record as an alarm?-- I'm not sure, but whether - was that point active at the time? Would it show up an alarm if it wasn't up on the screen as being active?

Well, you told me if it wasn't on the screen, it was deactivated. How could it show an alarm on the screen - the alarm log if it wasn't active, and the time is about right for when you were expecting the sample to come through on the span for point 18. It went in at 10.58. You would have had point 18 up there waiting for it?-- Yeah, that's true, and I got that - as I stated before, I got two noticeable alarms and that's it. I can't account for any of these.

Well, let's just have a look at this. After 10.47 that one was in fact acknowledged by you at 10.51, so let's look down the SIMTARS documents. By the time of the next entry, you had gone through and acknowledged and reset, according to you, if what you say is correct, that you followed that procedure, you had reset the machine, so the next reading should have come through as an alarm, shouldn't it, the one at 10.53? It's up there again double the gas high 2 level and yet it didn't. Well, let's look down. There is a batch of more four and a half percents come through but don't get recorded at all as alarms, even though, according to you, you would have reset

the machine and followed the procedure correctly, until we get down to the next one which alarmed in fact, or shows as an alarm at 11.58. It's the third from the bottom of that page. See it's come in at 4.5 again?-- Yes.

That alarmed and that was acknowledged within about 31 seconds, so that if you followed your correct procedure, the very next one should have logged as an alarm, the one at 12.03, yet on Exhibit 127 it hasn't. How do we explain that?-- Honestly I cannot explain it. I can only go on what I saw and what I have got.

Likewise, the next one, 12.08 and 12.14, the next one that actually alarms is at 12.22, and yet after that as we go down between 12.22 and 12.33 - the 12.22 one was acknowledged in 38 seconds and so the next one should have come through registering an alarm again because if what you say is true, you had gone through and followed the acknowledged procedure and the reset and the whole thing and yet it's recording these things in the accepted values and it doesn't actually get recorded in the alarm log. How do you explain it?-- As I say, I'm no expert on the machine, that's it; I don't know it.

Can you think of any explanation unless it's some problem with the software or the machine? It's not a problem with you, I take it, from what you say; you are sitting there?-- I am sitting there looking at it and I saw what I saw, accepted what I saw and that's it.

Can you think of anything that is consistent with that unless it's a problem with the machine or the software?-- Well, it's possible, isn't it?

I mean, when you couple that with what we looked at before, there is inexplicable two 38 minute periods which are completely contrary to what you say you saw?-- You are showing me a seven hour period where there was nothing reset. Well -----

Do you doubt - I mean, are you starting now to doubt the veracity of the alarm log?-- Well, I am.

I have nothing further.

MR CLAIR: Unfortunately, Your Worship, I do have some more questions.

FURTHER RE-EXAMINATION:

MR CLAIR: Mr Pearse, there is just something that I need to clear up in light of what's in your statement. You said in the statement that you made back when the inspectors were talking to you, 29 September, that you were on the day shift. I am looking at page 2 of that statement. I don't know whether you have got a copy of it there. You might care to

look at it, top of page 2. On the day shift, 7 August, you commenced a span gas test at about 8.45 a.m. You say, "I was on the monitor while Mick Caddell, deputy, and Brian Kelly, a miner, were to go underground to introduce the span gas." You go on: "The sequence of testing of the monitor points was agreed to between Mick and myself before he went underground and this is shown on the report sheet I made out dated 7 August '94 and which I observed to be contained in a document marked as document No 100." You see that?-- Yes.

Okay. You go on to say: "After Mick Caddell left I set up the first four test points to be done on the monitor and at about this time Michael Squires came in and asked if it was possible to keep 512 monitor point active on the screen while the testing was being done. I said it was no problem and put it up on the screen." Now, you described that sequence there and - well, first of all, let me ask you: is that an accurate reflection of the actual sequence of events on the day, on 7 August?-- As far as I can recollect, yes.

Okay. Well now, you say in that third paragraph, "After Mick Caddell left I set up the first four tests points." Now, the first four test points, according to this predetermined order of points that you have already referred to in Exhibit 11A, would be 19, 3, 4 and 8; is that right?-- Yes.

So, you set those up, and no doubt you left those up then until Michael Squires came in?-- Yes.

Do you remember how long after you set those up that Michael Squires came in? Are you able to make any estimate of that?-- No, I'm not really.

Not really?-- Not too long afterwards, I don't think.

You started this at about quarter to 9?-- Yes.

Or at least that's when you started -----?-- The testing.

----- the testing. So, if you go back - I will have to take you back unfortunately to page 21 in Appendix 2.1.7D. I think it's actually flagged there?-- 2.1.7D, yes.

Page 21?-- Mmm.

And about 12 lines from the bottom, 7 August 1994, 8.56.09; do you see that? Have you got page 21? It is down the bottom right-hand corner?-- I have 22, sorry.

Previous page?-- Yes. What time?

7 August 1994, 8.56.09?-- Yes.

You will see that it tests there?-- Mmm.

Now, of course, if you were starting this process some time not long after 8.45 a.m. - in your statement you say that you commenced the span gas test at about 8.45. You say then that Mick Caddell left and after he left you set up the first four test points; is that right?-- Yes.

So, would that 8.56 time be consistent with about the time you set up the first four test points - that is, points 19, 3, 4 and 8?-- Yeah, possibly, yeah.

And you had those set up and on the screen for some time before Michael Squires came in; is that right?-- Yeah, well, they would have been sitting there, yeah.

And Michael Squires came in and he said to you, as you said in your statement, "Is it possible to keep 512 monitor point active?", and you said, "Yes."?-- Yes.

You brought it back up again?-- Yes, I put point 5 - possibly I would have taken point 5 out and put point 8 up in its place.

If you look at the next entry there, you will see that point 5 comes back on again about 9.32?-- Yes.

Is that consistent, at least, with the time at which Michael Squires had spoken with you and then you brought point 5 back on line again?-- I thought it would have been possibly a bit earlier than that.

You say "possibly a bit earlier than that", but are you able to say now how much time elapsed?-- No, not really, no.

You have been referred to a passage over the page there where you see what is quite obviously the span gas coming through; is that right?-- Where am I?

This is about 15 lines down from the top?-- 12.09?

12.04 is 17.7 - that's the diluted sample, and then - well, we can assume that's a diluted sample. 12.09 is the span gas coming through; is that right?-- Yes.

And then the break that occurs then through to 12.47, in effect, occurs straight after that span gas test, it would appear?-- Yes.

Is that right?-- Yes.

You have got no idea how long it took for that - for the joint down there outside the 512 seals to be reconnected; is that right?-- No, I wouldn't know.

How long does it take for the span gas to go through?-- From point 5, 44 minutes.

But the actual sample-----?-- The sample would be put through, oh, in about 8 minutes or 10 minutes - about 10 minutes.

10 minutes to go through?-- Yeah.

And point 6, where is that, do you know?-- Point 6?

Do you know where point 6 is down below?-- That's in 5 South.

In 5 South?-- Yeah, north and south return I don't know.

How is the gas put through? Is there a bag of some kind it pumps from?-- No, you just take a bottle of test gas and the plastic bag is put over the element - over the thing - and just taped on and the gas is introduced and you keep the bag up until such time as the time has elapsed, and then take it off.

Does somebody have to be holding the bag for the gas to be sucked out of the bag?-- Yes.

Somebody has to be holding the bag?-- Yeah, regulate it so you don't blow the bag up.

So you-----?-- If you put too much gas in, you could blow the plastic bag. You keep a steady flow of gas into the bag to keep it inflated.

What happens after you actually put the eight minutes of gas into the system?-- Well, the bag is removed and you move on to the next point.

What happens if the bag is left on there?-- Well, it just gets sucked up and then, you know - yeah.

When you say it "gets sucked up", sucked up against the end of the tube?-- Yeah.

Does it actually get sucked right into the system?-- No, no, it is only a tube - small.

So, if the bag was left on there for a time, the bag gets sucked up against the system - is there any sample then to be sampled - any sample in the tube?-- No.

So, there wouldn't be anything to be sampled at the other end?-- No, that's right.

Now, I want to take you to the second section of the large

volume that you looked at with Mr Morrison a moment ago which is page 21 in Appendix 2.1.7K?-- Yes.

I am drawing your attention to 7 August, 10.04.26 - it is two thirds down the page?-- Yes.

You will see there that you get that 4.55 of methane registering somehow on point 18?-- Yes.

And that's, in fact, the one that alarms - I think he was drawing your attention to that. That's the first of those point 18's, not quite half-way down the page - 10.04.26?-- Yeah, righto.

4.55?-- Yes.

You have got that one there?-- Yes, that's right.

Now, that alarm registers at 10.04.26, but it is not acknowledged till 10.37.23, is it?-- Not by that, no.

If you go back to your volume - I mean, you have looked at 127 - Exhibit 127 to confirm that, haven't you?-- Yes.

Just for the record?-- Yes.

Now, if you go back to your volume 1 of that SIMTARS - or the annexure to - or appendix to the SIMTARS report, you will see that those other high points that he mentioned to you - 4.56, 4.57, 4.55, 4.56 - do you see those?-- Yes.

You will see that they all come through by 10.36; see that?-- Mmm, yeah.

That's in the third column, 10.36?-- Yes.

They are all through by 10.36 and then the alarm is acknowledged which brings your Unor system back on line as far as this point is concerned; is that right?-- Yes.

And it wouldn't come back on line - I mean, it is not going to register any alarm until the first alarm is acknowledged, is it?-- That's right.

So, 10.36 it comes back on line, and then the next line you will see there is a reading of 0.02?-- Yes.

Now, you may or may not be able to answer this, but we have had a series of questions of one witness the other day that was designed to illustrate this - that - and you agree or otherwise - but once you have an alarm acknowledged, the screen goes over to blue, doesn't it?-- Yes, yes.

And the screen actually won't go back to green until this - assuming, for the moment, that there is no resetting of the alarm levels?-- Mmm.

It won't go back to green until there is a pass of gas - that is, a sample of gas which is below the alarm level. Are you

able to comment on that or not?-- I'm not able to comment, but I can see the point you are going through, yes

Well, if you don't know that yourself, I just want you to assume that for the moment, because that's been part of the evidence - that it won't go back into alarm mode until there has been at least one pass of gas which is below the alarm level that you are talking about?-- I don't know that, no.

Just assume that. Have a look at the next one, because after you get the pass of gas at 0.02, then you get an alarm at 10.31.27?-- Mmm.

You see that?-- Yes.

It registers in your volume 4.55 - volume 1 there?-- Yes.

If you look at Exhibit 127, you will see it registers there?-- Yes.

That's the second of those point 18 alarms, 10.47.43?-- Yes.

Mr Morrison asked a string questions about the readings recorded after that. Perhaps I should, just to keep it in context, have you look at the fact that that alarm at 10.47.43 was acknowledged on the Unor at 10.51.37, you see?-- Yes.

So it was acknowledged fairly quickly?-- Yes.

And then he asked you about all these readings that follow that - 4.57, 4.52 - this is in volume 1?-- Yes.

4.55, 4.56, 4.54, and on it goes, all well above the 4.5 level - all well above, I should say - all well above the alarm level of 2 and he said to you, "Well, now, why wouldn't they cause an alarm?" Remember he was asking you that?-- Yes.

Well, just have a look at the sequence. You have come down to 11.52 - or 11.47.13 first of all. You will see there is a pass of gas at 0.03 per cent?-- Yes.

Then there is another pass of gas at 11.52 at 0.03 - 0.03 per cent, I should say?-- Yes.

And then you get 4.5 at 11.58.04-----?-- Yes.

-----showing in your volume there, and that comes up as an alarm on Exhibit 127 - the alarm log - doesn't it?-- Yes.

That's the next alarm - 11.58.04?-- Yes, right.

And you will see that that one is one of those that was accepted within a matter of seconds, really - 31 seconds?-- Yes.

Okay. So, that was accepted and then Mr Morrison was drawing your attention to all those high readings after that: 4.53, 4.47, 4.49 over the page there?-- Yes.

And saying, "Well, why didn't they alarm?"?-- Mmm.

Then you will see at 12.18 you get a pass of gas at 0.05?-- Yes.

And then the next reading, which is above 2, that's a reading of 4.38?-- Yes.

In fact - and that's shown in your volume 1 there. In fact, that shows up on the alarm log, doesn't it - that's the next alarm?-- 12.22.

12.22?-- 4.38, yes.

At 4.38, yes. Do you see that?-- Yes.

And then you get a reading of 4.2, which doesn't alarm, and I think Mr Morrison was asking you, "Well, why wouldn't it?"?-- Mmm.

Then you see the next pass is 0.08, which again is below the alarm level, and then you see the next one, which is above the alarm level of 2, 4.36 at 12.33 in your volume 1 there?-- 12-----

12.33, 4.36?-- Yes.

And if you look over at Exhibit 127, you will see that that's the next alarm you have got?-- Mmm.

12.33.50, 4.36?-- Yes.

So, if you make that assumption that you are not going to get an alarm until you get a pass of gas below the alarm level with which you are dealing at that time, then there is really nothing about these records that's inexplicable, is there?-- What's the meaning of the word "inexplicable"?

Sorry, then there is no difficulty in explaining that sequence of readings and alarms that I've just taken you through on pages 21 and 22 of that exhibit, volume 1, appendix 2.1.7K, is there?-- That's right.

Thank you, Your Worship.

MR MORRISON: May I ask him a couple of things with a view to getting him away this afternoon rather than tomorrow morning?

WARDEN: Yes.

MR MORRISON: Also to make sure we don't leave it on a note of confusion or obfuscation.

FURTHER CROSS-EXAMINATION:

WITNESS: Excuse me, can I have a drink of water?

Naturally, you can. Can you listen while you drink? Mr Clair asked you to make an assumption about what we have been told previously in the case and on that assumption what he says has some superficial attraction; that has to be said. In fact, no-one has discussed that feature in relation to exceeding gas high 2 alarms. You can't help us there, can you?-- No.

It was discussed in relation to alarm levels coming in or gas that was coming in between set points, but no-one has yet said anything about behaviour above gas high 2; do you know anything about that?-- No, I don't.

Well, looking again at that sequence - in fact, I'll just give you another one - another document which reflects the page you have been looking at, because it will probably help you to understand it. I want you to look at point 18 sequences commencing on 7 August at 9.48 a.m., through to 7 August at 12.55, and can you isolate those points either on the big SIMTARS volume or on the document I've just given you?-- 9.48, and what's the other one?

9.48 in the morning through till 12.55?-- Yes, righto.

Now, you can see from either the document I have given you, which is simply a distillation of the SIMTARS material, or from the SIMTARS material itself, that that is the period during which the sequence for points was altered; in other words, you only had three on the screen with one dropping out and another coming in?-- Yes.

And it is through that sequence - the minute that sequence was altered you got point 18, apparently, either acting up or recording strange values. Do you see that? It didn't do it before?-- No.

CH4 was running through at point 5 routinely?-- Mmm.

And then it acts weirdly for that period of time that I've discussed, and then after 12.55, if you look back at the SIMTARS material, when you finish your span test sequence you suddenly see it behaving properly again, back down to 0.6 - 0.69, 0.68?-- Yes.

How do you account for that? If the answer lies in some alteration of the sequence of sampling, how do you account for the behaviour of point 18?-- I don't know anything much about this machine. I can't honestly answer it. I don't know.

Well, particularly is it so when, as Mr Clair has so carefully pointed out to you, within this sequence, in the middle of all these four and a half readings, it does on two, four, six

occasions drop back down to 0.05 or 0.02, 0.08 - dramatically lower than what it was reading before?-- Mmm.

How do you account for that?-- As I say, I can't account for it.

Keep those documents with you for the time being and have a look at this document. I just ask you about the fact that you altered the sequence of points in order to do the span testing - in other words, you put a few points in the screen, as we heard. As they got dealt with, they dropped out and others were put in. Mr Clair took you to a SIMTARS document. You will have to look at that. Do you have 2.1.7D for point 5? It is probably the previous tag - first tag you have got there. He was trying to identify when it was that Squires asked you to put 5 back on the screen?-- Yes.

You were directed to that 38-odd minutes or - 36 minutes that I had taken you to at 8.56?-- Mmm.

See, 8.56 through to 9.32?-- Yes.

Mr Clair was asking you was that about the time that you might have told Squires to put it back on. You thought that might be consistent; is that right?-- As I say, I can't give exact times, but it could possibly be then.

Well, if you look back up the page - go back at two, four, six - about nine lines up to 8.25?-- Yeah.

See that?-- Yes.

Now, look at the line before it. What's the time?-- 8.07.

Eighteen minutes-----?-- Mmm.

-----when point 5 wasn't going on the screen; is that correct?-- Well, by this-----

Look at the other document I just gave you. This is - no, it is a number of pages. This is simply SIMTARS documents rejigged to show you the true - in fact, the sequence of points as they were actually sampled that morning by you - or by the machine. Let's look down them. 7.58 in the morning is the first one, and I'll read the sequence. You tell me if I get it wrong. I'm reading the points now, starting at 7.58. 9, 14, 16, 18, 19?-- That's correct.

No point 5 yet, is there?-- No.

Next sequence, 1, 3, 4, 5, see that?-- Yes.

It's the first time point 5 comes up in those two sequences, isn't it?-- Yes.

Comes up at 8.07?-- Yes.

Let's look down and find the next time that point 5 was actually sequenced by you. Answer, 8:25:50; is that right?-- By this, yeah.

Let's just assume that what I've given you is correct - it's come from the SIMTARS documents - in the two points that I've mentioned to you where point 5 gets a mention it's 8.07 through to 8.25?-- Yes.

As you look at it, isn't it true that it has gone through nearly three sequences of sampling of points between those times?-- Yes.

Clearly point 5 was dropped off the screen in that time, wasn't it?-- Wouldn't be dropped off the screen.

Well, it wasn't coming up in the sequence of sampling, was it, if this shows the sequence of points actually analysed. In other words, the air is coming up and it's going through the solenoids and being analysed and being recorded as a value rather than venting to air. If that's what this shows, point 5 was not in the sequences, was it?-- Yeah, but if you look - like when did I start my tests?

Well, first one popped up at 8.49, time arrived?-- Sent at 8.35.

Yes?-- So point 5 was on at 8.25, wasn't it?

Yes?-- And then four points later point 5 come up again.

That's right?-- And keep going and going and going.

What I'm saying to you, if you look at the sequences, point 5 had been dropped out for a time and then came back in and stayed in until that inexplicable 36 odd minutes and that this is when, more likely than not, Squires said to you, "Put point 5 back on the screen, please.", between 8.07 and 8.25?-- Yeah.

That's right, is it?-- Well, once it started to occur regularly was when - that was when I put it on the screen.

And we can see from 8.25 on it does appear regularly all the way down the line until we get to that very strange 36 minutes?-- That's right.

I thought we agreed before that the 36 minutes and the later 38 really can't be anything to do with Caddell down the pit, because if he breaks the line, even if he puts his thumb over

the end of it, it's still sampling something. It's either general body air or it's some part of the tube. It's not - doesn't drop off the screen because of anything he does, does it?-- No.

I'll have those documents back, I think, and that's all I have, thank you.

WARDEN: Thank you, witness. You may stand down. You may leave.

WITNESS EXCUSED

WARDEN: Is there any desirability to commence another witness at this stage?

MR CLAIR: It depends how long Your Worship intends to sit tonight. Mr Barraclough is the next witness. I don't expect him to be brief or short.

MR MORRISON: He is the oldest witness so far so some respect should be paid to age, in my respect.

WARDEN: I'm in your hands. We can go through a bit later, but I just doubt the value of it.

MR CLAIR: I'm in Your Worship's hands.

WARDEN: Thank you. Any problem with an earlier start tomorrow morning, nine o'clock?

MR MORRISON: No, that's all right.

WARDEN: We have a bit of time to make up, although Mr Bancroft says there is plenty of time left in 1995. Adjourn until nine o'clock.

THE COURT ADJOURNED AT 5.53 P.M. UNTIL 9 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 21/02/95

..DAY 29

THE COURT RESUMED AT 9.05 A.M.

MR MORRISON: Your Worship, yesterday afternoon I showed Mr Pearse a document and I am going to tender that document. I only have one copy at the moment. The photocopier has given up under the strain, and just as soon as it's revived I will produce copies for everybody else. I will tender that as an exhibit.

WARDEN: Thank you, Mr Morrison. I will just track down the number. I am told it's Exhibit 164. It will be admitted and marked Exhibit 164.

ADMITTED AND MARKED "EXHIBIT 164"

MR MORRISON: And going up the Bar table now and a copy to the members of the panel is another document which I will tender, and this is the SIMTARS document of the information taken and re-sorted - it's simply a re-sorting so that you can follow each point discretely. That's the information essentially compromised in Exhibit 127. The only extra information that it contains, apart from the re-sorting process, is you will see right in the middle of the page a new column, "Time Between Alarm and Acknowledgment", simply so you don't have to keep making those calculations in your head, or however you do it. In some cases with shoes off, I am sure. I tender that document as well.

WARDEN: That will be admitted and marked Exhibit 165.

ADMITTED AND MARKED "EXHIBIT 165"

WARDEN: I just might remind you at this point that the description of the exhibit as contained in that list will be the one that goes in the final report, unless you indicate otherwise. If you are going to quibble about the wording or the description, please let us know before the end of the proceedings so we can correct it. If there is a misdescription there, we want to know about it as soon as possible.

MR MORRISON: Well, perhaps I should sort of announce a description that I think would identify them easily and then people can think about that as they go. For Exhibit 164 I would suggest "sequence of points as analysed, 7 August 1994", and for Exhibit 165 "alarm log point by point" would do.

WARDEN: Yes, thank you. Thank you, Mr Clair.

MR CLAIR: Thank you, Your Worship. I call Joseph Barraclough.

JOSEPH BARRACLOUGH, SWORN AND EXAMINED:

MR CLAIR: Your full name is Joseph Barraclough; is that correct?-- That is correct.

Mr Barraclough, you are in the position described as safety/training undermanager with BHP Australia Coal at Moura No 2 Mine; is that so?-- That is correct.

You have been employed in the mining industry for some 44 years?-- That is so.

You have held supervisory and management positions since 1962; is that so?-- That is correct.

You were employed by Collinsville Coal from 1978 to 1991 as undermanager, then as manager and then superintendent; is that so?-- That is correct.

You joined BHP at Moura No 2 in 1992 as an undermanager and you took on specific responsibilities for safety and training and work model development in January 1993; is that right?-- That is correct.

At what stage in 1992 did you commence with Moura No 2?-- March, March 1992.

March?-- March 1992.

So, you had about nine months there as an undermanager?-- Before taking on the safety/training role, yes.

Now, during that nine months as an undermanager were you just one of several undermanagers or did you have some specific responsibilities during that time?-- No, I was classed as shift undermanager, and there was four or five of us and we rotated the three shifts, and obviously three shifts requires three undermanagers but we had four or five to cover for people away on courses and leave and other sort of absences from the mine.

Now, this step whereby you took on the specific responsibilities for safety/training and work model development, was that part of a more general re-organisation or was that something that happened specifically in relation to the position that you were occupying?-- In addition to the four or five undermanagers we had prior to February 1992 when I took on that position, we also had an undermanager doing the job that I am currently doing, that is safety/training, and that undermanager left approximately December 1992 and I was asked if I was interested in taking that appointment.

So, that was a specific position that already existed?-- Yes, correct.

Now, as part of the process that was carried out during 1993 involving the Quality Assurance program, there were certain position descriptions established for each position; is that right?-- That is correct.

Could the witness see Exhibit 12, please, Your Worship? At about page 13 in that document you will find a position description in respect of safety and training undermanager?-- Correct, I have that, yes.

You were occupying the position when those position descriptions were established, and it's your signature that appears some two pages after that; is that right?-- That is correct.

Acknowledging that you read and understood the contents of your position description?-- Yes, I signed that on the 21/12/93.

Now, that position description does outline, amongst other things, various responsibilities that attach to the position?-- Yes.

We don't need to go through those responsibilities one by one, but looking through them there are two that seem to have some specific relation to safety, as far as I can see, and that's number 8 which mentions, "To contribute to safety meetings and other communication processes."?-- Yes, correct.

And then number 10 that talks about, "To develop and maintain safe operating procedures, risk analysis, work models and skills audits where required."?-- That is so, yes.

I am not saying that there aren't others that are more incidentally related to safety; for instance, number 9, "To ensure all accident investigations and hazard/risk identification surveys are carried out in accordance with company policy."?-- Yes.

That's one, and perhaps even 11 which talks about, "Work in and promotion of continuous improvement", may have some incidental relationship with safety. The others are more specific responsibilities; is that so?-- Yes.

One through to 6?-- And 7.

Oh, yes, I am sorry, and 7, which is at the top of page 2, and that one provides for responsibility to ensure that all statistics and records are maintained to a high standard?-- Yes.

Now, I don't want to dwell on any particular one of those at the moment, perhaps it will be something that we might need to mention at a later stage, but, in any event, you did read that document and you understood what was meant by all of the parts

of that document; is that right?-- Yes, I did, that is correct.

Including that area dealing with responsibilities?-- Yes.

Now, you made a statement in relation to this matter on 29 August '94; is that right?-- That is correct.

In your statement you say on the first page there that you realised early in your experience that the safety/training role at Moura - sorry, in your experience in that safety/training role at Moura that the way the training system was laid out required a great deal of your involvement and time in the everyday teaching and testing area, much of which could be delegated to others in order to allow you to concentrate on the improvement of safety management. Now, just pausing there, this was the way that the role of that position was established when you took it on, was it?-- That is correct.

And you saw some opportunity to change that so that you could change the balance of your day-to-day activities; is that right?-- Yes, I wanted to change the whole scope of the position.

And did you do that?-- I did, yes.

What did you do?-- Well, as that statement says, I increased the number of people, for example, people qualified to be trained a trainer under a national standard. When I took on the position we had two, I increased that subsequently to 10, and the number of people who were what we call on-job instructors, we had 12 and I increased that to 15. That method of training relates, in the main, to training on mobile equipment, diesel equipment, where we took people through theory on the safety features and functions of the machine in a theory sense. Then we took them out into the field and gradually introduced them to the hands-on situation which eventually led to a formalised test and then an authorisation was issued by the mine manager for that person to operate that machine.

So, when you speak of "we" in that context, you are talking about those people involved in training, in effect, introduced the - what I will call recruits, as it were, to various areas of expertise in that way?-- Yes.

Particularly in relation to the operation of machinery?-- Yes. The whole concept that I wanted to pursue was I wanted to be able to monitor and administer training but delegate the actual operations, instructions and testing to others. That would allow me then to get more into the proactive safety activities which I perceived at the time to be important and necessary.

Now, you have spoken as to how the trainers trained recruits. How did you initially go about increasing the number of trainers? For a start, from which areas did you recruit people to be trainers?-- There are two distinct levels -

probably that's not the right word - there was the train-the-trainer people who are trained under a course put together by the Central University of Queensland in Rockhampton. That's a five day course, and they are the people that I increased from 2 to 10. That course deals with theories of learning, how do adults learn, that sort of process, how to do presentations in a classroom situation with visual aids, audio aids, videos, overhead projectors and that sort of thing, and then how to do testing, there is a technique on how to do testing, so those on-job - the train-the-trainers were what I call the senior trainers. After the theory had been conducted by either myself or one of those senior trainers, the trainee then went out into the field with an on-job instructor until the on-job instructor and the trainee both agreed and signed documents to say, "This person is now ready and capable for testing.", and then the testing was then done by one of the senior trainers who had not been involved in the training leading up to the testing.

Now, what I will call your senior trainers, the people who had done the train-the-trainer course, where were they recruited from in the mine, from various areas?-- They were recruited from - mainly from miners and in every case - they were recruited from miners, they were recruited from deputies and they were recruited from tradespeople, and in every case they were considered to be senior experienced people.

Just before we leave that aspect of training, you were then going to continue in a monitoring and supervisory role in respect of training. Did you do that?-- I certainly did.

Did you have input on the kinds of areas in which employees at the mine were to be trained - that is, what training programs were to be put in place?-- Yes.

Was that primarily your responsibility? I mean, did you conceive those things or did other people suggest what might be done and then you simply had an overview on that?-- In the main, when I took on the position the training was largely in relation to mobile equipment - mainly diesel equipment. There was a program in place and it was accepted by both union people and management people that training would be done on a perceived seniority basis; in other words, the person that had been there longest, if a vacancy arose on a particular machine for training, that person was then to do the training, provided that person was interested in pursuing that training.

Well, in any event, you maintained this monitoring role and it was really part of your function then to suggest what other or different areas of training might be introduced. I know you said that initially most training was in relation to the operation of machinery?-- Yes.

Did you have the power to suggest, "Well, look, we will do some training in this area or that area or set up these programs.", that sort of thing?-- That is correct.

That was a responsibility that you had?-- Yes.

And that was consistent with your responsibilities as accepted in that position description?-- That is correct.

You mentioned then that the delegation of a fair proportion of your day-to-day activities in the training area freed you up to get you more involved in safety?-- That is correct.

Now, can you tell the Inquiry then what you commenced to do in that area?-- Could I refer to some of the pages in my statement in trying to answer that question?

Well, perhaps on page 2 you talk about various areas in which you concentrated more on safety matters?-- Yes.

The first of those you mention is refresher training subjects?-- Yes.

Now, what system was established, first of all, to identify areas in which there should be refresher training and, secondly, to actually implement that kind of training?-- The refresher training subjects, as it states there, is in connection with Part 59 of the general rules of the coal mining legislation, which states that specific subjects and operations within the mine - people must have refresher training within a period of five years.

Which subjects arose in that connection?-- There were

subjects - I certainly can't remember them all because I think there was a list of about 14 or 15, but I do remember first-aid, emergency procedures, traffic rules, ignition sources, including spontaneous combustion and dust, significant incidents, self-rescuers, training in self-rescuers. As I said, I think there is about 14, and I'm sure they have been presented as exhibits to show the whole lot.

In answer to my question, the identification of areas for training, or at least refresher training, was very much by way of what was set out in the regulations - that is, that list of subjects you have just referred to?-- Yes.

Now, what about the system to implement that training? What steps did you take in that regard?-- Well, we - I had discussions with management - and management in that sense I mean Albert Schaus and George Mason - as to how and when is this training going to be conducted, in terms of would we do it in a few crew, would we do it in mass meetings? There were no set rules. It depended on the subject to be dealt with at the time as to the sort of timing and venue of that training.

Okay. Well, how far did you get, then, in organising that kind of thing?-- I think that we-----

Prior to 7 August last year, perhaps I should ask?-- Yes.

We are going back to when you were moved into this position in January 1993. How far did you get in establishing a system for this refresher training?-- We established what I believe is a very active training activity, which pursued right through the year, and we covered most of the areas that were specified within that list of Part 59 refresher subjects.

Was there any attempt to discover which people had their refresher training within the five years it was provided for and which people had records kept to try to ascertain which fields have been covered in respect of which employees?-- Yes, when I took on the position of safety/training undermanager in early 1993, there was a spread sheet on the computer which, whilst not complete, was a guide to me to develop further and improve, and that is the document that I have kept right through the year to enable me to keep an eye on dates and subjects and people.

Well, did that document seek to identify those people who have had their required refresher training within the past five years, or is it simply a document that listed when people did courses?-- Yes, it did, and I have a copy if you would like me to-----

I think we have seen it referred to and we may see more of it in due course. At this stage I don't want to get bogged down in too much detail. I'm more interested in what sort of systems were established, you see?-- Right.

You say that that document was part of a system that was established to identify who required their refresher training

in order to comply with the five year requirement?-- Yes.

Now, you did mention as one of the areas that required refresher training this aspect of sources of ignition?-- Yes.

Was there a record as to who had had their refresher training on sources of ignition, including spontaneous combustion, and who hadn't?-- There was a record, yes.

And when you took over, did that record indicate whether or not everybody had had their refresher training on that subject within the previous five years?-- As I recall, the original document did show dates and I think some of the dates were predominantly in 1990 where people had received training in various subjects in that category of refresher requirements.

But addressing this question of spontaneous combustion, as an ignition source - or ignition sources including spontaneous combustion, is the way you put it - were you able to establish whether those people that were employed at the mine that required refresher training had had it within that time-frame? Was the document sufficient for you - to enable you to do that, really, is what I'm asking?-- Yes, but I think I said earlier that the document probably wasn't complete, or the standard wasn't good enough, and I set about to improve that.

That's what I'm coming to. Did you then attempt to set up a system that would show that kind of thing?-- Yes.

That would show it in a complete way?-- Yes, the number of subjects required to be - for people to be refresher trained, and I think there is 12 or 15. I had for each of those a column - a vertical column in the spread sheet which related to amounts horizontal-----

That's the document that has been looked at here in Court; is that right? Details read from that?-- I do believe that the document you are referring to that has been presented in Court are extracts from the total document.

Okay. Now, this - and I'm selecting this area advisedly - this question of ignition sources and spontaneous combustion, was it an area that was given some attention then after you took over as the training and safety officer?-- Yes.

And in what way was that given attention? In relation to this refresher training?-- Yes.

And was there a program implemented to ensure that people had training in that area?-- The requirement under Part 59 of refresher training that contains spontaneous combustion, like all other requirements, was recognised by a reference number, and I just cannot remember the number that referred to spontaneous combustion, but it might have been something like 7.1.2.6, or something of that nature, and the precise wording relating to that reference number was something like "potential dangers, dust, spontaneous combustion and ignition sources". I think that was the sort of compact name given to that part of the requirement.

And then I think my question was: was there some program implemented after you took over as training and safety undermanager - some program implemented to ensure that people got training in this area of ignition sources, including spontaneous combustion?-- Within the topic that I have referred to, whatever number it is - 7 point whatever - referring to ignition sources and spontaneous combustion, we did deal with dust and we did deal with ignition sources - dust in relation to airborne dust, and wetting agents that we were using in an attempt to reduce the amount of airborne dust. The ignition sources were mainly in regard to cable flashes.

During the whole of the period then from January 1993 through until the day of the explosion in August of 1994, was there any course ever run at the mine by way of refresher training or any other sort of training that did deal specifically with spontaneous combustion?-- Apart from new inductees - new people with no experience coming to the mine - apart from those people, there was no training being done in connection with spontaneous combustion.

The new inductees, they would be people coming in at the bottom, in effect, as miners or as tradesmen-----?-- Tradesmen, miners and very inexperienced people - no experience people.

What sort of training were they given on this question of spontaneous combustion?-- Their training, like all other subjects covered in the basic induction, was based on the Queensland Standard, which is the induction package which is common right through all the mines in Queensland, which was originally produced in 1998 under the auspices-----

1988, or-----?-- Nineteen eighty-----

Sorry, which date?-- 1986 or 1988 - certainly in that sort of time frame - under the auspices of the Queensland Mining Council, or may have been the Queensland Coal Owners in those days.

And did that have very much content that related to spontaneous combustion as an ignition?-- It had content with regards to spontaneous combustion. It was included in a subject, I think, which was called "Mine Fires and Explosions", and spontaneous combustion was dealt with in that module.

Any literature that was given to the inductees on spontaneous combustion?-- There was a hand-out prepared from that sort of industry package.

When you say "a hand-out", what, a bundle of sheets, or-----?-- Oh, probably six, seven sheets stapled together, as most subjects had a hand-out.

Do you have any examples of that available at all - the hand-out that dealt with spontaneous combustion?-- I don't

have the hand-out with me now.

But you say there was a hand-out that was given to new inductees that dealt with spontaneous combustion?-- The hand-out was composite in terms of fires, explosions and ignition sources, and spontaneous combustion included in that document was one of the ignition sources.

But the six or seven page document, some part of it, you say, would be dealing with spontaneous combustion?-- Correct.

That then applied to the inductees. Was there ever any discussion between yourself and other members of management about refresher training courses for others at the mine in relation to spontaneous combustion?-- Early in my time as safety/training undermanager, having regard to my database spread sheet, I was aware that spontaneous combustion was a subject that had not been addressed and did need to be addressed.

Did you tell anybody about that-----?-- Yes.

-----awareness?-- I recognised that it needed to be addressed because of the five year sort of requirement by statute. I did discuss it with the mine manager, Albert Schaus, and said that I was about to embark on drawing up some training material.

At what point of time was that?-- Early in the year, probably March - probably not much later than April - certainly March or April.

1993?-- 1994.

1994?-- Yes.

What came out of those discussions then?-- I read the green - sorry, the blue and the red book as to how to go about writing this training package for training on spontaneous combustion. I thought that might be an aid to the training, and I sent a fax to the Queensland Mining Council who were the - I think they were co-sponsors of the original document, and asked was it possible to obtain copies and if so what cost and at what stage could they be delivered. Some few days after that I received a phone call from a lady at the Queensland Mining Council who said, "We have done some checks on your request and these documents are no longer in existence and you will have to - if you want to do anything, you will have to write your own material."

Did that instil you with any sense of urgency to get something together on that front, particularly in light of the requirements for refresher training that you've spoken of?-- In sense of urgency, no. I knew that I had to sort of write the material. I had to do some research and then write the material and then do the - put the training package together and do the training. Whilst at that time I was thinking, "Well, I need to be thinking about writing this. I should be doing something because I just can't leave it as, `All right, I can't do that training now because I haven't got the material together.' What am I going to do instead at this point in time...", and then I decided that we would embark on another refresher subject which was the self-rescuer, training in the self-rescuer.

And did that mean that the spontaneous combustion program then took a back seat or at least ended up on the corner of your desk rather than in the middle of it, to speak figuratively?-- Yes, it was still there. It was in my mind. I had drawn up some brief notes as to what we might look at in the training material, but I certainly got active in the self-rescuer training.

In terms of priority, perhaps recognition of spontaneous combustion signs might be more a preventative measure than concentrating on the self-rescuer training which rather more follows the event; is that so? Do you agree with that observation?-- I certainly consider that the self-rescuer was an important issue in terms of training that had to be dealt with.

Let me ask you this: did you recognise that spontaneous combustion was an issue in terms of training that had to be addressed?-- My initial thoughts on doing spontaneous combustion training was based on the requirement that faced me when I looked at my spread sheet, that it needed to be done.

It grew more out of a concern to fulfil the statutory requirements than any real appreciation of a risk of spontaneous combustion at Moura No 2; is that so?-- That is correct.

Okay. Now, just pausing for a moment, you, of course, personally had spent most of your working life at Collinsville; is that right?-- Most of my working life in

Australia in Collinsville, yes.

In Australia, I'm sorry. Now, Collinsville was, I suppose, comparing it with Moura No 2 or with the Bowen basin coal, even Collinsville was not what you would call a gassy mine; is that so?-- Collinsville was not gassy in terms of methane.

What about in terms of the liability to spontaneous combustion? Had you ever been aware of any comparison that had been made between Collinsville coal and Bowen basin coal?-- I was aware that Collinsville coal had a propensity for spontaneous combustion. I gained that by observations on a number of occasions of stock piles on the surface that had been left for periods of time and not moved that were showing signs of smoke. So I gained from that that Collinsville had a propensity for spontaneous combustion.

What about the Bowen basin coal? What experience had you had with that?-- Other than Collinsville?

Well, the Moura coal?-- I had no experience whatsoever.

Did you have any discussions with anyone about the propensity of the Moura coal to spontaneous combustion? Did you see that as being any different to Collinsville coal?-- Collinsville had a unique feature in that the natural seam gas was carbon dioxide where the natural seam gas in Moura is methane.

Yes?-- Carbon dioxide has a relative density of 1.5 compared with air of unity, of one, which means, of course, that it sinks to the ground. So whilst I believed that the Collinsville coal had a propensity for spontaneous combustion the very nature of the coal - sorry, the gas in the seam sinking to the floor displacing the coal away from any coal that might be on the floor prevented or reduced - certainly reduced and in some cases prevented oxidation of the coal.

You mean displacing the air away from the coal?-- Displacing the air including oxygen away from the coal, yes.

So there was, comparatively speaking, an inhibiting factor on the prospect for spontaneous combustion with the Collinsville coal?-- Yes.

Which wasn't present in Moura?-- That is correct.

Now, can I pass on to that second area then on page 2 of those that you identify as safety matters, and that is this area described as "Hazard and Risk Identification Control". Now, how did you go about this matter of risk identification at Moura No 2?-- The thrust that I wanted to pursue in that particular area was to - putting it simply, to be pro-active. I wanted to move away from the traditional concept that, all right, we have had an accident, we have had an injury, someone's been hurt. We better investigate it and then decide what we are going to do about preventing a reoccurrence. The hazard and risk identification and control concept was to sort of be in a position where we could identify what - look ahead, be pro-active, look ahead and look at areas where we could

say, "Right, what's going to happen here? Do we have a new piece of equipment? A new procedure? Changes to procedures or something that's about to occur? We need to sit down before the event and try and find out what are the risks, what's the potential and the consequences of that risk and what controls can we put in place to eliminate it happening."

Right. Now, that's what you wanted to achieve. How did you then set out to achieve that? What would you do as a first step towards identifying the risks?-- Well, as I've side, some of the procedures were potential changes in systems. For example, we did a risk analysis on 402 potential extraction system, 511 potential extraction system. We did a risk analysis on the acquirement of a diesel shuttle car. We did a risk assessment on the purchase of radio remote control of a continuous miner and there were a number of others that are in my statement like that where we sat down with various people in a consultative process and just worked through the risk analysis identification and control system.

Well, would you agree that it would be fair to say that one of the risks at Moura - or one of the hazards, call it what you will, was this danger associated with spontaneous combustion? I mean it's one that leaps out of the whole operation, isn't it?-- Spontaneous combustion was not perceived by myself at the time as being of major significance. Never at any time did any person, miner, deputy, member of management, say that we had a major issue, and that included a host of other people and in that I probably could include mines inspectorate, union inspectorate. It never came to my notice that we had a major potential in that area.

You arrived in Queensland in - at least you were employed by Collinsville Coal in 1978; was that when you arrived in Queensland?-- Yes.

In 1978 was there still much discussion of Kianga?-- I can't remember there being much discussion on Kianga, but I certainly did read some document resulting from the inquiry into Kianga.

The report published as a result of the inquiry?-- Yes.

Did that suggest to you that spontaneous combustion was a matter that had to be watched?-- It suggested to me that there had been an incident in Moura. I cannot remember the details of reading that. I mean I read that document years ago when I was in Collinsville and I can't remember all the precise details of it.

But did you take any major points from it? Were there any major lessons to be learned that stayed in your mind as a result of reading the document?-- Some of the points. I remember reading something about six months of incubation period that was in that document, the need for vigilance, the need for monitoring and being aware of introduction of up-to-date, state-of-the-art instrumentation.

In fact at Moura No 2 when you started there there was a

practice of monitoring the gases in the mine; is that right? There was a Unor system and there were also readings taken by deputies on shift; is that right?-- There was certainly a Unor system, yes.

And there were gas readings taken by deputies on shift? I'm not saying every shift, but -----?-- Yes. Deputies did take readings on shifts, but I wouldn't say all deputies did that.

Part of the reason for having a Unor system and for having gas readings being taken, whether it be on a shift basis or on a weekly basis in order to calculate some CO make, part of the reason for all of those measures was to at least keep an eye out for spontaneous combustion?-- To monitor the atmosphere with spontaneous combustion being very much a point to watch, yes.

Wouldn't that in itself indicate that spontaneous combustion was a risk that should have been readily identified as one associated with the conduct of the operation at Moura No 2? I mean even putting aside Kianga, even putting aside any suggestion of a higher than usual risk to spontaneous combustion, nevertheless the possible occurrence of spontaneous combustion was surely a risk that should have been readily identified?-- That is correct. During my time at Moura I had experienced and been actively involved in a number of sealings, in the region of probably four or maybe six sections which were bord and pillar development and then extraction and then sealed, and prior to 512 section, even using all the monitoring systems that we had I was not aware, and I'm sure we did not have any problems in relation to spontaneous combustion.

That's in respect of the sealings that occurred after you started at the mine?-- The four or six sealings that I was involved with.

There had, of course, been earlier concerns about spontaneous combustion for a start in connection with the sealing at 5 North?-- I was not aware of the 5 North incident until post August 7 and what I have heard here in this inquiry. I was not aware of it.

Have you ever seen a report in relation to that?-- I had seen no documentations. I had heard no verbal discussions on that point.

There was, amongst the records at the mine, a comprehensive report on the sealing on 19 April 1986 or thereabouts - 21 April 1986 perhaps of 5 North West. That was never brought to your attention at all?-- I have only learnt of that during this inquiry.

That's document 124 I'm referring to, Your Worship, in Exhibit 9. Now, of course, I suppose that ignorance, if I can call it that, on your part of part of the history of Moura No 2 put you at somewhat of a disadvantage in identifying the risks; is that so?-- In that sense I suppose I must agree with you, but really I do not know what I do not know, and as I said

earlier, never at any time did anyone raise with me that we should be looking at spon com because of 5 North or whatever reason.

It wasn't raised with you and it didn't at any time occur to you that this was a risk that did need some particular attention?-- Yes, spon com control is a risk, but in view of all my background and the absence of any knowledge, and because of the monitoring that we did in all the four or six sealings that I was involved with, the risk appeared low and the control measures appeared adequate because we did not have any problems with it.

On page 2 of your statement in the second half of the page there you are asked that question about whether the training was appropriate to risks contained at the mine and you outlined what you perceived to be the principal risks. You mention there high methane content, unstable ribs, manual handling of equipment and then cable handling and management?-- Yes.

You describe those as the principal risks?-- Yes.

No reference to spontaneous combustion even as a principal

risk at the mine?-- At that time on 29 August, as I have tried to explain earlier, the potential for spontaneous combustion was not major in my mind.

That was after the explosion, of course, 29 August?-- On 29 August I was not aware that the explosion was initiated by spontaneous combustion.

Of course, with all the benefit of what you have heard in the course of the hearing, you would answer that question differently now, is that so; that is, as to what the risks are at the mine or were at the mine?-- During this Inquiry I believe everyone has improved one's knowledge, and that includes myself, and I am a different person now than what I was on 7 August, yes.

Can I go back to this matter of the areas that you regarded as being safety matters that had to be attended? We have dealt with the second one of those that you have mentioned in your statement, hazard and risk identification/control. The third one you have there is accident/incident investigation and reporting?-- Yes.

Now, that was an area that you specifically addressed?-- Yes. When I took over the post there was a system of accident and incident reporting. It did not come up to certainly my standards and it did not come up to the standards of the mine manager, Albert Schaus, and we set about improving our activities in that area.

And how did you do that?-- Oh, there is a number of ways that we did that. Previously not all accidents were reported unless they turned out to be a claim on compensation and then documentation was provided basically for the purpose of compensation claims. We instituted systems whereby all accidents that appeared to be a future potential compensation claim, we investigated all those on a formal form. We investigated all incidents, even though there may not be any injuries. If they were considered to be high potential, we investigated those. We also reached the stage where all injuries reported, even if it was just a black fingernail, we will go through a formal accident investigation. We also introduced, at the instigation of the mine manager, a system where if there was an incident where a cable was damaged, and certainly if the cable damage turned out to be reportable in terms of sparks or flames had been observed which was, under the Statute, a reportable incident, we placed a quarantine around the place, we would fence the place off, production stopped. We had initially a blue form which was the first record in relation to that cable damage, and the form was designed to get a first-hand knowledge from the witnesses like the operator, the deputy, the fitter, the electrician who may have been there at the time of the incident. So, we used that document as a base for the investigation. We notified the Mines Department that this incident had occurred and we awaited his arrival, which may have been that day, it may have been the day after or it may have even been after that before the inspector arrived, and the place was just fenced off, no

production taking place until that investigation was completed.

Now, when you refer to an incident there as opposed to an accident, what sort of thing are you referring to?-- I've got difficulty in trying to define what is an incident and what is an accident. It's one of those things that I think if you asked 50 people what their definition was, you would get many, many different definitions.

Perhaps I am not looking so much at the distinction between incident and accident; I am just looking at what level something has to be before it's called an incident. Is it something that's defined in relation to an event that indicates a risk?-- It indicates a risk, it indicates personal injury.

It indicates personal injury?-- It could indicate potential personal injury. For example, could I quote an instance? A vehicle being driven underground getting out of control and suddenly coming to a stop by hitting the rib, for example, no personal injury to the driver but there was high potential for injury to him, to someone else or to the equipment.

Coming to the area that I want to address, the reporting of a smell or a haze that might indicate the possibility of spontaneous combustion, is that something that falls into your category of incident?-- That has never occurred, but I would believe if it did occur, I would class that as an incident, yes.

Because what you are wanting to do is to have a report of those things that might indicate the existence of some danger?-- That's right.

Okay?-- We tried to be proactive in these things.

Yes. And it's true to say that if you collect some sort of history of incidents of that kind, then it enables you to look at a picture that grows out of a continuing history; is that right?-- From which improvements can be made, yes.

Or through which dangers can be recognised?-- Exactly.

If one or more people are in a position to take into account all of the reported incidents in the sense that you have just described them, then that person or those persons may well be able to make an informed judgment as to the level of danger that might be arising in a situation; is that right?-- I'm sorry, could you repeat that?

If one or more persons were in a position to be aware of all of the incidents indicating the possibility of danger through the keeping of some history of the kind that you have spoken of?-- Yes.

Then that person or those persons, if there are a number of them, would be in a position to make some informed judgment as to whether or not some particular danger exists?-- Yes.

You have got to know all the symptoms before you can diagnose the problem?-- Exactly.

Anyway, under the system that you would like to have established, ideally incidents such as the occurrence of a smell or the occurrence of a haze in a panel would be recorded?-- Yes, I would think it's sufficiently important for it to be included in that category, yes.

Now, the next area of safety that you refer to in your statement is the establishment of a consultative safety committee which you say had a principal focus of being on safe behavioural involvement. Now, can I ask you, first of all, what you mean there by "safe behavioural involvement"?-- We established a safety committee which included membership from all the various interests at the mine in the sense that we had a check inspector miner as the chairman, a check inspector miner as the secretary, we had an electrician, we had a fitter and we had myself as a staff member. We were a very active committee, and it wasn't just a sit-down-and-talk committee, we were active in the sense that we did surveys in an attempt to ascertain what was happening at the mine, and we worked following some papers that were delivered during 1993/1994 on the subject of safe behavioural involvement, and it's something that the National Safety Council of Australia have been developing and are still currently developing. One of the initial things that we did was to go underground and observe certain aspects. For example, when two high pressure hoses are connected together, they tend to be snap-lock, they push in and then they snap together and lock in. There has been many incidents, not just at Moura but throughout industry, where for some reason or other that snap-lock has become disengaged, and a flying hose under high pressure can become very dangerous. So, what is good practice is to fit what is called a safety clip between one coupling and the other having made the connection and that safety clip then will prevent any accidental uncoupling of that joint. Just to follow the example, what we did - and that's only just one example - we examined the mine, we did a survey all around the mine, and looked at a number of joints that were good and a number of joints that did not have the safety clips, and we - over a period of time we produced a graph, and I just can't remember the figures now, but it may well have been that on the first survey we only had 66 or - 66 sticks in my mind - 66 per cent of compliance. We then did a briefing exercise to everybody, both in terms of undermanager's shift meetings and by also an electronic noticeboard which was present at the start point, and the message was, "Safety clips are not always being used, please make sure that you use them.", and over a number of weeks following this sort of survey principle and the communication principle, one could see that that percentage compliance raised, 66 per cent, 70 per cent, 80 per cent, 90 per cent, and we did that in a number of areas, and that's what I mean by involvement, the involvement of people, involvement of everybody, the general raising of awareness of people's environment and what they are doing.

You go on to say in your statement that - and you have touched

on this - that there was concentration on - for one of the safety matters was to adopt a proactive approach to management and safety, and you have explained that that meant you were attempting to anticipate risks and not to wait until areas identified themselves; is that so?-- That is correct.

Now, there are two aspects to that, of course. A proactive approach to management, does that imply that really there needed to be what I will refer to as an active management of problems; that is, to be ready to grasp the problem and make decisions about it?-- Yes, I think - I mean, the proactive approach to management of safety.

Management of safety?-- Management of safety. What I am trying to say there is that we should not - and this is an example again - we should not wait until a high pressure hose joint fails before we do something about it. We should be there to step ahead of it. That's what I mean -----

Err on the side of caution?-- Yes.

Rather than take risks?-- We were trying to identify what risks existed.

And in that connection then was this proactive approach to management of safety - was this something that needed to be inculcated both in the management and in the miners?-- Yes, right across - when one looks at safety there is no difference between management, miners, electricians or anyone; we are all in it there together.

Was there any specific move taken to change people's approach to safety; that is, to try to make them more proactive?-- I think so. I think that following Albert Schaus' appointment and following my appointment, the matters of safety with regards to, for example, more regular safety meetings, which I refer to as mass meetings, mass meetings in the sense that we attempted, or we did catch all employees over a period of four shifts within a 24 hour period. We also introduced supervisors' weekly tool box talks where the supervisors had to get together with their crew and talk about some specific topic or any topic that was pertinent to that particular crew.

What about as far as the actual management of the mine was concerned - and in that I refer to the undermanagers in particular and the deputies - was there any sort of program implemented to ensure that they were aware of the need to take a positive and proactive approach in safety matters?-- The undermanagers were involved in implementing some of the recommendations that came from the various bodies that existed. They themselves conducted their weekly tool box meetings, for example.

That was implementation of specific recommendations -----?-- Yes.

----- that came out of those meetings, or problems that were raised at the meetings?-- Sorry?

Or problems that were raised at the meetings?-- Yes.

Now, you have spoken of your training role earlier, and I want to come back to that for a moment because you say that that was still a matter that was your responsibility, although you had delegated many of the day-to-day activities, the training aspect?-- Yes, despite the fact that I delegated some of the hands-on day-to-day stuff, I was still obviously responsible for administering and monitoring the whole training function.

You have attached to your statement there a series of sheets, five sheets, which you have headed "Overview of Training and Communication"?-- Yes.

That's part of document 70/19, Your Worship, Mr Barraclough's statement, which in turn is part of Exhibit 9. Now, if we can go to those sheets just briefly. It's broken down into the first area of "Communication and Presentations to Employees at Shift Meetings in Training Room", and then there is a whole list of things that fall into four categories, (a), (b), (c) and (d)?-- Correct.

Were they presentations that actually took place or were they areas that were recognised as areas that should be addressed?-- They were a mixture of both. These were feed-backs to what I refer to as the mass meeting where we discussed forthcoming events; for example, the top one under (a) "511 extraction system", where the people would be briefed and introduced to what the 511 extraction system was going to be and what the safety procedures were going to be.

Well, that's the first general area, "Mining Methods and Systems"?-- Yes.

The next is "Mobile Equipment"?-- Yes.

The third is "Face Area Cable Damage" and the fourth is "Significant Incidents"?-- Yes.

Under each of those headings - and there are a number of specific items - what I'm trying to ascertain is whether these items are listed as items that were dealt with at shift meetings, or whether they are listed as matters that were to be dealt with - some of them having been dealt with and others not - that's my first question in relation to them, you see?-- As I understand your question, under the general heading of "Overview of Training and Communication", the first item is "Communication and Presentations to Employees at Shift Meetings in Training Room". Each of these specific things listed under - as you have described, (a), (b), (c) and (d) - were discussed at those meetings and have been minuted.

So, this is a record of what was, in fact, discussed?-- Yes.

No mention of spontaneous combustion there because that was never dealt with at any of these meetings; is that right?-- That is correct.

And then there is a second area under the overview, and that is classroom formal training sessions. Again, is that a list of things that were addressed at particular training sessions?-- Yes. Could I just go back a step, please, if you don't mind?

Yes?-- If you look at page 2 of 4-----

That's the second page of your statement?-- Yes.

Yes?-- Half-way down I was asked a question by Mr Mike Walker: "Can it be shown that the training being provided at the mine is appropriate to the risks contained in the mine?", and an aside to that was the question: "What are the principal risks?", and I said, "High methane content, unstable ribs, manual handling of equipment, cable handling/management". The next question from Mr Walker was: "Can you describe what you did within those areas?", and my reply was: "I'm sorry, I cannot do that just sitting here. I need to go away and do some research and provide you with the information.", and all that information is then contained in the pages 1 through to 5.

Yes, that being the attachment to your statement?-- That is correct.

And that's the document to which I was just referring, which is headed "Overview of Training and Communication"?-- That is correct.

And this document we have established deals with items that were, in fact, discussed at the meetings?-- Yes.

It is not a list of things that you would regard as being appropriate to deal with; this is a list of things that were, in fact, dealt with?-- All those things on those attachments have been dealt with, yes.

And it makes reference to the classroom formal training sessions as a second area of communication, or at least of

training and communication?-- Yes.

Next is "On-the-job Training and Procedure Development", and you set out a number of things there?-- Yes.

The fourth is "Supervisors Weekly Tool Box Meeting Themes"?-- Yes.

You set out a number of matters there?-- Yes.

Now, again with those - the further three areas, there is no mention of spontaneous combustion simply because, as you have explained, it was never actually dealt with at any of these meetings?-- That is correct.

And that was because, in turn, you hadn't perceived it yourself as an area of risk or significant risk?-- I hadn't seen it as a potential or significant risk, and no views came to me from others in that respect.

I want to ask you about this aspect of training that deals with reporting and recording - that is, communication between people. Now, I don't know that that's one that actually figures in the list of things that are dealt with, but I think you have agreed, in fact, that one of the aspects of managing risk - one of the aspects of a pro-active approach, even, is that whoever has to make decisions needs to be properly informed; is that right - that is, people can't make proper decisions unless they are aware of all the relevant factors?-- Correct.

Now, in that connection, was there any consideration in the training connection given to training people how to report on what had happened; for instance, how to do their deputies' reports or how undermanagers' reports should be done, or even how there may be some full and useful communication between undermanagers and the management and between the deputies and undermanagers, and even between miners and deputies?-- Well, if I can try and answer the written report side of your question? Some time during Bruce Danvers' time - Bruce Danvers being my predecessor in the safety/training role - and I think this carried on into my period of time, too - it was considered that the deputies' report existing at that time was not sufficient. It wasn't up to the standard that certain people perceived as being required, and there was an exercise conducted whereby deputies were consulted and there was a consensus in sort of draft form that, "This is a better report than our existing report.", and that eventually was accepted, sent to the printers, and I believe that is the current report that is being used at - up to August 7. So, I think that in trying to answer your question, yes, it was perceived the reporting system in that respect wasn't good enough and the deputies, along with management, got together and produced a report that appeared to be more satisfactory to the requirements. I believe - I don't believe, I know that the same thing happened with the undermanagers' report, too - that we improved the style, the design, the requirements of information with respect to the undermanagers' report.

That relates then to the form of the report?-- Yes.

What about the actual content that was inserted by deputies and undermanagers filling out their reports? Was there any training designed to inform them as to how they could make best use of the report; that is, communicate some useful information - for instance, the use of terms and what sort of information needed to be put in there in terms of whether or not there was any danger or perceived danger?-- I cannot recall any formal training that was undertaken in respect of deputies' reports or undermanagers' reports. I am aware that there was the daily ongoing reprimand or reminder that, "Why didn't you put that in?", or, "Don't you think you should have put that in?", "Didn't you think it important enough to put it in?", but that was an ongoing, daily, face-to-face communication.

Who would communicate that sort of thing?-- George Mason.

To whom?-- To the deputies, to the undermanagers.

And were you present on occasions when that sort of thing happened?-- Yes.

I mean, obviously there is some skill involved in filling out these reports; do you agree?-- I think the standard of report writing depends greatly on the report writer, and some people produce better reports than others, for whatever reason.

And to some extent you can improve a report writer by training him in how to fill out the report - as to what's needed and what sort of terms he should use?-- I think that we could improve the report writing by, yes, training the writer and also designing the report such that it is pretty well automatic as to what information you have got to put in the thing.

And the second feature, of course - a report can be designed to elicit a lot more information than what's elicited by the present form of report?-- Yes.

In terms of the information that should be put in there - you have been here throughout this matter, you have seen a pretty wide range of information or degrees of information, for instance, that would be put in a deputy's report. Some deputies are very brief in what they put in, other deputies are fulsome?-- I have not seen some of these documents in the Inquiry. I have certainly heard reference to them and I have seen them obviously at the mine.

And then in relation to undermanagers' reports, there would seem to be a great gulf between what undermanagers are aware of and the information which finds its way into their reports?-- Yes.

And you have heard the expression - views of undermanagers that have been in the box as to what was required in their reports, and there seems to be some divergence of views as to how much information should go into the reports; would you

agree with that?-- I wasn't present when Mr Atkinson gave his report.

You may be at a disadvantage, but did you, as a trainer and a person associated with safety, have a view as to how much information an undermanager should be putting into his report from shift to shift?-- I think the person making the report has to take regard of who's going to read the report; what is the report for? Is it for the record? Is it for history? Is it for someone else to follow on from me from here on? Is it to bring to the attention of someone else that certain things exist? And I think the writer is aware - should be aware of those sort of things relating to the requirements of the report.

For instance, if an undermanager was made aware of the existence of a smell in a panel, there would be no question, would there, that that should go into a report?-- If I could speak for myself? If I heard that sort of thing, there is no doubt that it would be in my report.

If he smelled a smell himself in a panel-----?-- That is correct.

-----he would put that into his report?-- If an undermanager himself smelled a smell, not only should he report it, but I believe he should have investigated it and report on the results of the investigation.

It's certainly a starting point to say that that at least should go into his report?-- Yes.

Now, if there was an event that required a fairly comprehensive inspection in a panel by an undermanager, you would expect that he would report fairly fully on that in his written report. Put aside what he would do in any oral sense, you would expect he would report fully on that; is that right?-- That is correct.

In his written report?-- Yes.

Are you able to say whether there were any steps taken during your time to train the undermanagers in the way that they should report events during their shift?-- I think I may have tried to answer that earlier, Mr Clair, in saying that I do not recall any formal training that took place in that respect, other than the informal kick-up-the-backside, "You should do it better."

Okay. One of the other aspects of safety, of course, was the monitoring of gases in the mine; is that right?-- Yes.

Which was conducted, first of all, on an ongoing basis through the Unor and Maihak system?-- Yes.

The Unor system?-- Yes.

Now, that system really played a very important role in the monitoring, didn't it, because people tended to place reliance

on what they saw?-- I believe the Maihak was the primary monitor. It was the primary one that existed at the mine on an ongoing basis.

Was there any step taken to train people, first of all in the use of that system, and secondly, and perhaps on a broader basis, to train a larger number of people too in understanding what they would see when they looked at the results - the screen results in that system? Can we take those one at a time? First of all, training people in the use of the system?-- I do not believe any formal system existed in training of the system.

Did you ever have any training yourself?-- I was instrumental in purchasing a similar unit in Collinsville in 1983 or thereabouts. I was trained at that time. When I went to Moura in 1992, I requested Max Robertson to give me a rundown on the system, refresh my memory, "How do we accept alarms?", and that sort of thing.

Right?-- And he did that.

Did you feel competent after Max Robertson told you what to do?-- Yes, I did. I had no doubts that I knew how to read the system, interpret the system, accept alarms, yes. Well, the system was very, very user friendly.

As far as you were aware, was there any system of responsibility or authority in relation to the use of that Maihak system?-- I believed all undermanagers were in the same position that I was - that they had the knowledge and ability to understand the system and accept alarms as required.

But were you ever made aware of any system whereby there was some allocation of authority to people to use that Maihak system, and some allocation of responsibility to specific persons in relation to the system?-- No, my understanding was that Max Robertson and maybe Andy List, an electrician, and maybe one or two electricians were able to assist if, for example, an undermanager wasn't there or an undermanager didn't understand a specific instance.

What about in terms of restriction of the number of people that could use this system? Were you aware of any restriction, or was it just there to be used by anybody who knew how to use it?-- I knew of no restriction whatsoever, no.

For a start, when you were shown the system was it suggested to you that you would use a particular number to identify yourself when you accepted an alarm or acknowledged an alarm and reset the system?-- No, on Max Robertson's induction or introduction or training, at my request he indicated to accept an alarm you have to press two digits.

Any two digits?-- Any two digits.

So you were really familiar with the way in which that system operated, you could operate it yourself to the extent that you've described?-- Yes.

You were aware of the fact that there was no restriction on the number of people that could use it and no allocation of authority in respect of its use?-- That's correct.

Did that concern you at all from a safety point of view given that you had a fairly high level of responsibility in relation to safety?-- No, I don't think it did concern me in the sense that the only time I can recall anything happening with the Maihak was during times of sealing, and what I'm referring to is when gas levels started to breach pre-set levels, and it appeared that there was always people around at that time that could handle the situation.

Yes, people around that could handle it, but did it worry you that there wasn't any restriction on the people that had access to it or that there was no way of identifying people who had acted in relation to it either by accepting alarms or - resetting alarm levels?-- I cannot recall forming any concerns at that time, no.

In terms of accepting those alarms you were aware that it was hooked up to the siren, the Unor system was hooked up to the siren that also was activated by other kinds of alarms at the mine apart from Unor?-- That is correct.

Did you familiarise yourself with the way that that siren system was operated?-- Yes.

Did you have any concerns about the continued operation of the siren given the way the system operated?-- Concerns about the siren itself?

Yes?-- Very much so.

No, no, about the continued operation of the siren, that is did you satisfy yourself that the siren would remain operative so that it could give an alarm at necessary times?-- Yeah, the siren was obviously connected to the monitoring system. The monitoring room was next to the undermanager's office and when the alarm went off one couldn't get to the button fast enough to cancel the alarm because it was uncomfortable, intolerable.

And unless the alarm was reset at the Con Log it wouldn't activate when the next alarm came in. If it was a Unor alarm that had tripped the siren and it wasn't reset after the alarm

had been acknowledged on the Unor system, the siren wouldn't go off again, would it, the next time a Unor alarm came in?-- That's as I understand it, yes.

Well, did you have any concerns that if the Con Log wasn't reset that then any future Unor alarm wouldn't provide a siren, wouldn't activate the siren?-- I cannot recall having any concerns because I believed that peoples knowledge was like my knowledge that I had gained from Max Robertson in the early days of my time there.

Well, that would be the people that had your level of training in that system, is that right, people had been shown how to operate it properly?-- I think that is correct, yes.

But then again on what you knew really there didn't seem to be any restriction on the number of people that could use it? From what you were aware of there wasn't any specific restriction on the number of people that could use the system?-- That's what I appeared to have gained, yes.

And it was quite possible that somebody might know how to turn the siren off because, as you say, once the siren started - once it was activated the response was that you couldn't get it off soon enough?-- That is correct.

But a person may know how to turn the siren off but not know how to accept the alarm on the Unor system and thereby provide the way to reactivate the siren again; isn't that so?-- That is so.

And as a result of that you could have the siren off but an alarm going unacknowledged at the Unor itself for some lengthy period of time?-- My observations were that in the event of alarms, which were not very frequent by any standards, electricians or Max Robertson or people capable to address the situation were available. They were there to deal with it.

That was your observation?-- Yes.

But if there wasn't anybody there to deal with it it's true that a siren could be turned off and the alarm go unacknowledged for a lengthy period of time, and I think you've heard of examples where they have?-- I have heard what I have heard in this inquiry, yes.

In any event, you didn't have any concerns yourself about the effectiveness of that alarm system or at least any sufficient concerns to think that people needed to be trained in its use; is that what you are saying?-- Yes. I thought we had a satisfactory situation to deal with any eventuality.

Did you ever make any inquiries about the calibration of that system, what steps were taken with a view to calibrating it?-- No, I didn't make any inquiries but I was aware that Maihak, through a friend of mine Les Walters, did periodic service and calibration of the equipment.

Just on that aspect of the Unor and acceptance of alarms, did

it ever occur to you when you were instructed in its use or at any time after that that there was a system there and established within the Unor system itself whereby a person who accepted an alarm could be identified, that is by using a particular number?-- Sorry, could I have the first part of the question again?

Did it ever occur to you, either when you were trained in the use of the Unor or after that, that there was a way within the Unor system whereby the person who did acknowledge an alarm on the Unor could be identified by use of a specific number?-- No, no, I was instructed, as I've said earlier, any two digits will satisfy the requirements of the computer.

You were associated with installing a similar system previously before you came to Moura?-- Correct.

When you installed that system was there any question of using specific numbers to accept an alarm?-- I'm sorry, I cannot recall that.

What did you think was the purpose of just activating any two numbers to acknowledge, I say "acknowledge", an alarm at the Unor?-- Well, I can only surmise that the system was designed whereby the person activating or acknowledging the alarm could be identified.

That wasn't implemented?-- It appears that that was not implemented, yes.

Did you think there would be any benefit in having that part of the system implemented so that a person who acknowledged an alarm could be subsequently identified?-- Having sat through this inquiry I believe that, yes, that would be beneficial.

That could be quite important really to demonstrate who it was who had knowledge of that particular alarm; isn't that right?-- That is correct.

And it could also be important to have those people who are authorised to accept an alarm restricted to a certain group or to at least to have a restricted number of people who might be authorised to accept an alarm?-- Yes, bearing in mind that some of those restricted people must be on site at all times.

So that there is always somebody there to do it?-- Yes.

Your Worship, I'm about to move to another area which will take a little while. This might be an appropriate time to take the break.

WARDEN: Thank you. We will have a short adjournment for 10 minutes, please.

THE COURT ADJOURNED AT 10.51 A.M.

THE COURT RESUMED AT 11.06 A.M.

JOSEPH BARRACLOUGH, CONTINUING:

MR CLAIR: Mr Barraclough, I wanted to move now to your specific knowledge in respect of 512 Panel and in particular the events that occurred while you were acting manager for a period there, but just before I go to that specific period of your acting managership, can I ask you what involvement you had in the 512 Panel up to that time? In particular I am interested, first of all, in what input you might have had in the design of the panel. Did you have a role at all in relation to that?-- I certainly didn't have a role in it. My hesitancy there was to try and recall any specific sort of thing, but generally, no, I did not.

You weren't yourself consulted about any safety aspects of the panel design?-- We were always concerned with rib stability anywhere in the mine, not specific to 512. Rib stability was always on the boil, as it were. It was a constant thing that we discussed.

Well, you say that, but were you consulted at any time in relation to the design of 512 with a view then to rib stability problems?-- Not that I can recall, no, not apart from the exercise that we did within the risk analysis of the 512 -----

That came - well, perhaps you can tell the Inquiry, how did that arise?-- I was advised by the mine manager, Albert Schaus, that we were to conduct a risk analysis in respect of the 512 extraction and ACIRL and one of their associate, or subsidiary companies would be facilitating that risk assessment exercise.

Were you told what it was that led to that risk assessment being carried out?-- No.

Were you made aware of any concerns that had been expressed about the safety of the design of 512?-- I do believe I've learnt later that there was some communication between Mr Walker, the mines inspector, and Albert in relation to certain things, but I was not privy to the details of that, and maybe that led up to the need for a risk analysis. I have no recollection - I have no intimate knowledge of any of that.

That basically was the extent of your knowledge, that there had been some communication from Mr Walker relating to some aspect of the 512 design and then there was this safety audit to be carried out, or risk analysis, I should say, to be carried out?-- Yes, I wasn't clear whether the risk analysis was specific to 512 or it was to be the first of an ongoing thing.

Now, ACIRL had been involved in designing the panel?-- I

believe that is correct, yes.

Did you yourself have any view as to whether it was appropriate for ACIRL to be involved in the risk analysis or whether a risk analysis should be carried out by some independent -----?-- I had no views. My views are that if we have resources available, internal or external, that we make use of them.

To what extent were you involved then in the risk analysis?-- I was a member of the group that sat and deliberated for a number of days. I did not sit throughout every hour of every day, but I certainly did spend some time in the exercise, which I assess in total may have taken something like six days over a period of two weeks or some similar period.

And what role did you play when you were present? I mean, were you there to have input on the actual safety of the design or -----?-- I was just a member of the group that - the first part of the exercise was to identify the risk, just ask the question, "What could go wrong in 512?", and Terry O'Beirne, I think, from ACIRL, who was one of the facilitators, he just wrote on the whiteboard all of the things that people were throwing up at the time, a brainstorm activity, just throw them up, don't analyse them, just write them down, and there were a group of us, miners, tradespeople, deputies, myself, other members of management, and we threw these up on the board, and then the next stage was to assess the sort of degree of probability or consequence of all those things, and then Terry O'Beirne would leave and there would be a break for a few days while he put all that onto paper. Then we reconvened again and then did a similar exercise with regards to what's the probabilities and consequences of this and they were identified around the group of people. Again he went away, and I think the next time he came he brought a laptop computer where it was readily available then on paper, and the last stage of the exercise was to say, "Okay, we have identified the risks, the probabilities, now what are the controls that we need to put into place?", and I was just one of the group of people that sat through that exercise.

Now, was the exercise concerned with questions such as ventilation or any difficulties with - or possible difficulties with spontaneous combustion, or was it an exercise more concerned about the actual design of the pillar?-- I understood that the purpose of the exercise was ultimately to eliminate personal injuries in the form of roof collapse, rib collapse and that sort of thing.

And that's what you recall -----?-- That's what I understand was the objective of the exercise.

You had that involvement with the risk analysis. What about with the management of the panel particularly when it moved into its extraction phase, both in terms of ventilation and in terms of monitoring the gases, did you have any involvement with that? This is before you took on your appointment as acting manager?-- I had a general sort of involvement in the sense that I had a habit of looking at the Maihak screen,

irrespective of whether we were in extraction mode or whether we were in development mode anywhere in the mine. It was just a habit I have developed over the years. I also got involved with 512 during my periods as undermanager in charge of the mine during weekends which -----

How often would you be in that role?-- ----- which occurred on a roster basis, something like four or five - every four or five weekends.

Do you recall how often then you were the undermanager in charge on weekend shift during that extraction phase?-- I can't answer that. All I can remember is that I was undermanager on the weekend of July 17, I think, whatever day that is, and then prior to that I was undermanager on June 16 or thereabouts. So, taking that further back, it would probably mean that I was undermanager sometime in May and then sometime in April.

Now, during the occasions that you were undermanager, what specific problems, if any, arose in relation to 512; that is, when you were undermanager on shift?-- I cannot recall any major significant problems with 512. There was one occasion in June, around about June 16, 17, 18, when we - I was in the section approximately lunchtime on the Saturday of that weekend. We were producing coal on that day, and there was substantial roof fall activity within the goaf, and apart from that incident I cannot recall any other major significant happenings.

You say that was on a Saturday?-- Saturday morning.

Specifically?-- In June, around about the 16th or 18th. I just cannot recall the exact date.

Do you remember who was the deputy at that time?-- Yes, Steve Bryon was the deputy.

Did you just happen to be down in the panel at that time or were you called down because of some specific problem?-- No, as part of an undermanager's duty, it requires him to inspect daily all parts where people work and travel, and I was in the section just doing my normal duties of being there.

And that was on 16 June or thereabouts?-- That was on the Saturday of that weekend. I cannot recall the exact date.

Were there any other events around that time that you became involved in, any reports of anything unusual in the panel?-- I remember the first day of extraction, which I believe was way back in - sometime in April probably when I was underground, and I think it was a Friday, and I do not remember being undermanager at that time. I was there for some other reason or part of my role, and I observed that some of the planned extraction system had been breached; in other words, things had been done that should not have been done.

Too much taken off the pillars?-- That was the first day of - probably the first three shifts of the commencement of the

extraction phase.

Was it that too much had been taken off the pillars or was it some other problem, do you remember?-- No, I think we were taking bottoms across 13 cross-cut and also we were hitting the pillar on the solid side of that cross-cut, and it was the intention of the plan that we did not reduce, or we did not extract too much coal in that area or coal beyond a certain amount because we wanted to maintain the stability of that roadway to enable personnel to examine the roadway.

What steps did you take to overcome those problems?-- On return to the surface I reported that situation to the mine manager, Albert Schaus.

Do you know what happened as a result of that?-- As a result of that Albert Schaus arranged to call all the three - he arranged to see all the three production crews who had been in and around - who had been in 512 on that particular time, and he called them in on three separate occasions. He called the day shift in at probably 6.15, the afternoon shift at their arrival and then the night shift either before the night shift went down or when they came out the next day, but he got the people in the office - in the training room and spelt out that here we are only 24 hours into an extraction system and we have already breached it, and he really laid it down that it's not on and serious repercussions will occur if - will result if anything like this occurs again.

That is, that the extraction plan had to be strictly complied with?-- That is right.

And, of course, there is a temptation sometimes to take more coal than is provided for in the extraction phase?-- There is a temptation to do that, yes.

Because sometimes there is easy coal available which can be taken during a shift and increase production for that shift; is that right?-- That is correct.

Other times, of course, it may be, I suppose, just ignorance of the details of the extraction plan that might lead to those sorts of things?-- Yes.

Now, you say that was on the very first day, then, of extraction. After that, did you have any particular involvement with the panel? You say that there were probably other weekends when you were the shift undermanager. Do you recall any difficulties with ventilation, for instance, during times when you were undermanager?-- No, never.

Any difficulties with high readings of methane or CO?-- No.

Did you find yourself in a position where you had to give any thought to what was happening in 512 panel, as far as any CO make was concerned, prior to your taking the position of acting manager in July?-- Did I give any thought to it?

Yes. Did you find yourself in a position where you had to give any thought to that - this is, prior to taking over as acting manager?-- I do not recall that, no.

There was nothing that arose that was discussed with you or brought to your attention that caused you to think at that time about what might be happening in 512 panel?-- Not that I can recall, no.

Now, you were appointed as acting manager for the period 11 July to Sunday, 31 July 1994?-- That is correct.

And if you just have a look at this letter here? That's a letter from Mr Schaus dated 6 July 1994 indicating that he was going to be absent from the mine between 11 July and 31 July and indicating that you would be acting manager in his absence; is that so?-- That is correct.

And that is a letter to Mr Walker?-- That is correct.

The inspector - Senior Inspector in Rockhampton?-- Mmm.

And attached to that is the document that's required under the provisions of the Act, appointing you as acting manager; is that so?-- That is correct.

I tender that, Your Worship.

WARDEN: Exhibit 166.

ADMITTED AND MARKED "EXHIBIT 166"

MR CLAIR: Mr Barraclough, you commenced, then, on the 11th of July. We know that on 22 July some incidents occurred in respect of 512 panel. I'll come to that in a moment. But prior to the 22nd of July and while you were acting manager, did you become aware of any matters of particular concern or significance in respect of 512 panel?-- No, I did not.

As acting manager, did you take an interest in the level of gas readings in 512? I mean, I know you said you generally kept an eye on that sort of thing anyway, but as acting manager did you take any particular interest in that?-- Yes, I knew that the carbon monoxide concentration was increasing as time progressed.

When you say you knew that, you had seen some increase in the CO levels from the beginning of extraction at least; is that right?-- I had seen the trend both on the Maihak screen and also on the documentation that was produced by the ventilation officer on a weekly basis.

What you had seen on the Maihak screen was, of course, the level of carbon monoxide in terms of parts per million; is that right?-- That is correct.

And on the Maihak screen you also saw the Graham's Ratio?-- That is correct.

Did you understand what the Graham's Ratio indicated?-- Yes, I did.

Did you see anything about that to be concerned - or that gave you any concern up to that point when you were acting manager?-- No, I believe that the rise in CO was due to increase in areas of coal available for oxidation and that was also reflected by the Graham's Ratio.

Now, you also had available the readings that have been taken by deputies of the CO in parts per million - that would be in the deputies' reports; is that right? Did you see those?-- The deputies' reports indicating CO were not very regular prior to a certain date in July.

Some deputies took CO readings?-- I believe some did.

And some didn't; is that what you are saying?-- Yes.

There was then, of course, the weekly survey undertaken by the ventilation officer?-- Yes.

And as you understood that, that weekly survey involved his taking both the CO in parts per million and the velocity of ventilation at particular points; is that right, and then calculating the CO make?-- Yes.

Did you take an interest in the CO make; that is, as opposed to the single level in parts per million?-- I had never operated - I had never used CO make as a tool. I believed that if one looked at the CO make graph and the shape of it, it would be no different from a graph of parts per million, assuming, if it was correct to assume, that the velocity remained at a somewhat stable situation.

Of course, the velocity can vary from time to time, can't it?-- That is correct. I'm aware of that.

The old system was that - I say "old" - that's prior to about '86 or thereabouts - was that it was the CO in parts per million that was regarded as the significant feature to be watched; is that right?-- That was one feature, but my background has been Graham's Ratio. Graham's Ratio is an indicator which I have placed reliance on. It comes back from my studies many years ago, and the Graham's Ratio is independent of quantity of air or velocity of air.

Well, we have heard that there was this change around about '86/'87 when more weight was put on the CO make and there was then the practice to calculate the CO make. That was a change that you didn't really take to, or at least implement in your thinking; is that what you are saying?-- Again, I have increased my knowledge during the Inquiry and that is one of the areas in which I have improved my knowledge from - if I may add, from 1984 until 1991, as superintendent I was involved in both underground mining and open-cut mining and probably 85 per cent of my time and activities was in the open-cut mine.

Right. So, the short of it is really you weren't particularly conscious of the significance of the CO make even when you took over as manager in July?-- That is correct.

Of '94?-- That is correct.

Did anybody ever discuss it with you - that is, that it was necessary, really, to keep an eye on that CO make - when I say "anybody", anybody at Moura No 2 - other members of the management or even undermanagers or deputies?-- No-one ever discussed CO make at any time, apart from the ventilation officer's weekly Friday assessment of conditions.

Now, you have said that you understood the increasing levels of CO then in parts per million during the extraction phase in 512 to be consistent with the mining method - that is, the exposure of more coal in the course of extraction - and for that reason you would expect an increasing level of CO?-- That is correct.

Now, on what knowledge, on your part, was that view based? I mean, had you done some specific research about that, or was that just something that you had thought that you developed over the years yourself?-- I believe that all coals have a propensity to oxidise - some coals may have more propensity than others - but there are other factors including sort of

types of coal, quality of coal, mining methods, and probably other sort of factors. Textbooks and my education years ago expressed coal oxidises and CO is produced. In my time at Moura during the 406 sealings that I have been aware of, and on some I've been involved with, CO did rise during the extraction phase of those sections.

Did you know what sort of rate of increase to expect?-- The rate of growth of CO make was not known to me.

So, while you had an expectation that it would increase during extraction, you didn't really know at what rate-----?-- That is correct.

-----it would increase. I guess it follows from what you said before that you didn't really know what you should be looking for in terms of the rate of increase in the CO make, because CO make was not a feature to which you attached any particular importance?-- That is correct. If I may add: I used my main indicator or my main monitor as being the Graham's Ratio.

Well, did you know what to expect in terms of the Graham's Ratio?-- Different - there has been different figures used to express sort of levels of concern and levels of danger, but I've always remembered that anything in excess of 0.4 per cent as a ratio should be seen as a concern.

0.4 per cent?-- 0.4 per cent.

Now, I was asking you about your period as acting manager and your involvement with 512. I think you have said there was nothing particular that occurred up until that Friday, 22 July to cause you any concern in respect of 512 panel?-- That is correct.

Friday, 22 July - oh, perhaps I should ask you this: when you were appointed as acting manager, or before that, were you told of any incidents in relation to 512 during June; for instance, the smelling of a slight tarry smell, or of a slight Benzene smell at all?-- I had no indication - I had no knowledge of either of those two occurrences.

Were you told of any difficulties with ventilation backing up in the No 2 roadway and of some layering in that roadway?-- I was not aware of that.

In retrospect, do you think that indicates a difficulty with the communication system at the mine - the reporting and communication system? You were taking over as acting manager; 512 was a current extraction panel at the time you took over?-- Yes.

And there had been at the time you took over - within the previous month there had been these instances of a smell reported on two occasions?-- Right, yes.

And this instance of actual backing up and layering in No 2 heading. Now, in those circumstances, do you think that you were put at something of a disadvantage in managing the panel,

which was then under your control, by not being told or not being aware of those things?-- I find it very difficult to understand how a person can detect whatever it is he detects - a smell or a haze - and virtually does nothing about it. I would have thought that investigations should have been carried out to determine a number of things to get to the bottom of what really was happening. Unless you do that - and then you can determine exactly what is the smell, what is the haze - I find it difficult to sort of consider what decisions you need to make next.

Well, we have heard evidence of the events on 17 June when Mr McCamley was down there with Reece Robertson, a deputy, and others and carried out what was a reasonably significant inspection. I won't describe it as a comprehensive investigation, I've never suggested it was that, but they carried out a reasonably significant inspection of the goaf areas in light of the layering in the No 2 roadway and reversal of ventilation in fact in that roadway. Now, that, it seems, found its way into a deputy's report at least, and we have been told that it was mentioned to other members of the management - I won't go through the details of that. Mr McCamley also told us that on that day he smelled - I think he described it as a very slight tar smell, something like that. Now, on 24 June Mr Robertson who was deputy again reported on that day a slight benzene smell and that found its way into his deputy's report and he also discussed that at the time with the undermanager. Now, given that those events occurred and that there was at least, it appears, some reporting of the circumstances of the event, do you think that there then should have been some system to ensure that the reporting of those events was brought to the attention of more people first of all, at the mine?-- I do believe that the - I cannot imagine any more serious situation in a mine than a report of a haze or a smell and I believe that full and accurate investigation needs to be carried out.

Do you think that, as I asked you, do you think that it indicates that there should have been a fuller reporting of that so that there could be more people made aware of those events?-- Probably. It does appear from what I've heard that things were not done that should have been done.

One way to ensure that those things are done is to make sure there is a system whereby more people become aware of the incidents, if I can call them that?-- Yes.

And does it suggest to you that really a far better system of reporting and recording these sorts of incidents needs to be established?-- From what I have heard in this inquiry I cannot disagree with that.

And some system that in some way ensures that those kinds of incidents, a smell, a haze as you've suggested, or in this case the backing up of ventilation in the No 2 heading, a system whereby those kinds of incidents are somehow registered as alarm incidents, that is matters that remain there as live matters, live alarm type matters until they are dealt with and fully investigated?-- Yes.

Perhaps without you being familiar with all of the aspects of establishing a computer program, do you think that there is scope for some sort of computer reporting whereby those things can be kept alive on a system until they are somehow acknowledged by some person in authority who can deal with them?-- I believe such a system is inevitable. Even in schools today students seem to have thrown the pen away and developed laptops. In answer to your question, yes, computerisation will come about as a natural thing, not just because of this incident.

And in conjunction with that, that there be a system whereby acknowledgment of these alarm items, items of concern that need to be addressed, acknowledgment be by way of a system that identifies the person who has acknowledged them and who is at a high enough level of responsibility to accept responsibility for them?-- I think that's crucial.

The kind of system that perhaps was there in a raw fashion in relation to the Unor system, that is identification of persons who accept or acknowledge alarms, but perhaps a more sophisticated one; is that right?-- Yes.

In any event, you were certainly put at a disadvantage by not being aware of these earlier incidents at the time that you took over responsibility as acting manager; is that right?-- That is correct, yes.

Against that background, on Friday, 22 July you were approached by Steve Bryon and Jacques Abrahamse; is that right?-- That is correct, yes.

Can you recall just what conversation took place when they approached you?-- I was in the end office, the end office which was the normal office for Allan Morieson, the ventilation officer, and Jacques Abrahamse. I was on the computer ordering from the stores some safety equipment. Other people were in the office when I arrived, and during the time I was on the computer Steve Bryon and Jacques Abrahamse and others - and at the time I couldn't remember who the others were but I have since realised it was Peter Rose - informed me that they had - whilst Steve Bryon and Peter Rose had been underground they had on their 21/31 Drager unit detected 8 ppm of CO in the No 1 top return of 512.

Just pausing there a moment, what was your response to the suggestion of 8 ppm? What did that cause you to think?-- I recall that that was two parts or thereabouts in excess of what the previous week's figure had been, and it was also in excess of what I had observed earlier in the morning on the Maihak screen.

Would that be a matter then that would cause you some concern?-- I was concerned.

Because of the level itself of 8 ppm or because of the increase that it suggested?-- I was concerned because I had encountered some change, a change from the previous week and a change from what was shown on the Maihak screen. There were some discrepancies, some inconsistencies. I went and examined again at that time, which was around about lunchtime, 12, 1 p.m. on Friday the 22nd, I went and checked with the Maihak screen again as to what the levels - what the CO parts were reading at that point in time, or that is the last reading, the last analysis and what the preceding few analyses had been to cover the time whilst Rose and Bryon were doing their underground assessment.

Yes?-- And I could find nothing on the parts per million

screen that differed from the six, and it had been at six for a number of days, and I also noted that the Graham's Ratio was still stable and had been stable throughout the days at something like 0.8.

Was there any conversation with you about the CO make at that stage?-- It was raised and I can't remember who raised it, but the eight parts meant that we were at something like 18 lpm of CO.

Was that a matter of any significance for you?-- The figure of 18 itself did not mean anything to me other than the fact that it was higher than what it had been the previous week and that wasn't a surprise because it just reflected the increase in the parts anyway.

Were you aware at all of what was contained in the Strang and Mackenzie-Wood book about there being concern once you got above 10 lpm and a situation - or very dangerous situation as you approached 20 lpm?-- At that time I was not aware. I am certainly aware now, but I was not at that time.

What happened next? You had this conversation with them, you went and had a look at the Unor, I think you said. Do you remember what you -----?-- Yeah, the conversation sort of continued for a few minutes. I requested to see the tube, the Drager tube, and it wasn't available because they say it had been left underground. I asked, "Had you taken more than one reading?", and, "No, we just took that one tube.", and I did make the remark that I would have thought it appropriate to certainly take more than one. I did ask, "Are you sure that you have taken it under the proper procedures?", and the response from Steve Bryon to that was somewhat humourous to the extent of, "You think I'm stupid or something?", knowing that Steve Bryon was an experienced man and it was probably - he saw it as an insult to him that I had to ask him, "Are you sure you've taken it under the proper conditions?" "You think I'm stupid or something? Yes, of course I have."

He was an experienced miner?-- Sorry?

I say he was an experienced miner?-- He was an experienced miner. He is an experienced deputy. He's a member of Mines Rescue, has been for a number of years, and has used that instrument over a number of years.

But, of course, you were familiar with the way in which a Drager tube reading was done?-- Yes.

And were there various aspects to it which could have some effect on the final result?-- Yeah, the Drager reading is a - depends very much on manual and mental abilities. There are a number of features. For example, the pump works by inflating and deflating the aspirator pump which draws an atmosphere through and then through the tube. The tube requires - the sample requires 10 pumps of the aspirator pump, and I've known over the years that it is possible for people to get something other than 10. They may count to one, two, three, four and then forget whether they were at three or whether they were at

five and they carry on, or if they have got someone with them, bearing in mind that each of these things can take a number of seconds, and if there is someone present and we are having a bit of a chat there is no guarantee that the end result is actually 10 pumps. It could go - anything. So there is - the number of pumps might be subjective. The action of the pump requires that the bulb is fully deflated and then fully inflated and different people with different grasps may do that differently. There is the possibility of a pinhole being present in the rubber aspirator pump. There is always the problem of people reading the value - the stain value as shown on the tube. Some people require glasses, some people don't require glasses. Some people have problems with different colours and things. There is a shelf life for the Drager tubes and it could well be that people may be using tubes outside the shelf life, and it is necessary for tubes to be stored at below a certain temperature that I can't remember the value, but the normal storage is by - putting them in the refrigerator. So any of these features could have a bearing on the accuracy of the reading taken.

All of these things were running through your mind at the time, were they?-- That is correct.

Your initial response, particularly against the background that the reading had been consistently at, I think you said 6 ppm as you understood it or around that level?-- Yes.

All of these things suggested to you that the reading must have been an incorrect one?-- Yes, based on the fact that none of the information on the Maihak supported that there was an increase at the same time as that Drager reading was taken.

Now, what was your initial response then to this higher reading? I mean you have agreed that perhaps with these things in your mind and all the information you had you thought, well, it may well have been an incorrect reading, but did you arrange for some action to be taken?-- Yes, I was left with having to make a decision. What do I do about it? Do I just forget about it or do I take some action? Obviously I chose to take some action. I wanted to confirm or dispel that eight parts was correct or incorrect. Steve Bryon and Peter Rose were about to finish their shift and I did ask Jacques - George Mason at the time who I should have approached - George Mason at the time was on business elsewhere on the mining site. I did ask Jacques Abrahamse if he would make arrangements for another Drager reading to be taken that afternoon, that day.

And did you make any other arrangements or ask that any other arrangements be made on a longer term basis?-- Yes, I had the thought that, "Okay, I'm trying - it looks here as though I'm going to dispel that this eight parts was incorrect, but that's surmising that the Maihak is correct. So what I want to do is to be able from here on to compare the Drager reading and the Maihak more regularly." So I also asked Jacques if he would put in a place a system whereby we could have Drager readings taken daily from that point on.

How long after the initial approach from Jacques Abrahamse and Steve Bryon was that done? Was that still the middle of the day or the end of the day that you made those arrangements?-- No, that was during the discussion. I believe that we were all there when that discussion took place.

So that was set up at that stage and Jacques agreed to do that, did he?-- Yes, yes.

And as far as you knew he went away to set up arrangements to do that?-- Yes. I should have done that through George Mason because George Mason is in authority, Jacques wasn't, but I asked Jacques if he would sort of follow that through for me.

You also mentioned about having a second test taken that day. Did you have in mind at that stage who might do that?-- No.

But did you subsequently learn that Dave Kerr was there at the mine?-- Yes, at about seven, 7.30, eight o'clock that night I got a call from George Mason to indicate to me that that reading had been taken and it had been found to be between five and 6 ppm.

And you understood that that was a reading that had been taken that afternoon?-- Yes.

Was it mentioned that Dave Kerr was present when that reading was taken?-- I cannot remember at that telephone conversation whether Dave Kerr's name was mentioned. I cannot remember that.

Well now, you were still acting manager then the following

week; is that right?-- That is correct.

Did you follow up what happened in relation to your instruction that there be a Drager reading taken every day?-- Yes.

When did you follow that up?-- I think on the Monday I examined the deputies' reports that had been made out during the weekend and were on the undermanager's desk early Monday morning when I arrived at 5.45, and I just scanned through those reports and saw that the figures that I had requested had in fact been recorded on the deputies' reports.

On the deputies' reports?-- Yes.

Did you see anything - any other method of recording by way of a table or a graph?-- No, I did not.

Could the witness see Exhibit 94 and Exhibit 93 also, Your Worship? Now, did you see either of those documents - 93 is the graph and 94 is a table - either of those documents that day at all, the Monday?-- Not on the Monday, no.

That's Monday, 25 July?-- No, I did not.

Did you see them sometime after the Monday?-- No, I did not.

When was the first time you saw those?-- I believe I saw Exhibit 94 in an earlier version to this on Friday the 22nd. For example, the top entry on Exhibit 94 which refers to 22/7, Friday, vent station 46, showing 8 parts Drager and a CO litres per minute of 18.98, I believe I saw that data there at the time of the discussion with Steve Bryon, Peter Rose and Jacques Abrahamse, but I do not remember seeing any of the subsequent information shown on Exhibit 94.

The table that you saw with that entry up the top, was that a table that had dates sequentially down the left-hand side, that is, 22, 23, 24, 25, or did it have some other dates down there, or didn't you notice what dates were there?-- I cannot recall that, but I think if I had, I would have probably asked why are they there anyway because they are daily ones and this graph is usually - this tabulation is usually produced on a weekly basis.

So, when you say an earlier version, you mean just a table that had the same information in it as appears in the first entry there but that's all that was on it at that time?-- The top entry.

Yes?-- It does appear as though all the other entries have occurred after that conversation.

Yes, that's right. We have been told that this is a document that Jacques Abrahamse put together in response to your request for daily readings?-- Yes.

And that the sequential dates down the left-hand side are

consistent with that?-- It does appear so, yes.

If you look at Exhibit 93 there, you will see that that graph provides for the entry of daily readings at least from 22 July on?-- It does appear so, yes.

Now, I understand you to say that you certainly didn't see either of these documents during the following week at the mine?-- That is correct, I did not.

When did you first see them? I mean, after the explosion or at any time before the explosion on 7 August?-- This is the first time I have seen them since you provided them to me at this very moment.

Okay. Now, you say that on the Monday at least you had a look at the deputies' reports to see that the readings were being taken. During the week did you take any other steps to ensure that your direction that there be daily readings taken on the Drager tubes were being carried out?-- Yes, I did. I took an active role in looking at deputies' reports as they came in, particularly during the early morning. When I say "the early morning", I refer to the time when night shift deputies were coming out of the mine and reporting to the undermanager and giving the undermanager his shift report, as was the system, and that time would be 6.35, 6.40.

Would you only look at the deputy's report then for the night shift or would you look back over the other reports for the previous day?-- I would probably look at the end of day shift too and probably look at the afternoon shift which, by that time, would have been pinned up on the noticeboard alongside the lamp room, which again is part of the system.

And when you looked at those reports, what readings did you tend to look at? What items of readings did you look at?-- I was looking at probably the parts per million as the primary thing that I was looking at.

Of course, you didn't attach any significance to the CO make?-- That is correct.

And you wouldn't have calculated the CO make yourself from the readings on the deputies' reports?-- I did not.

The system involving those two documents in front of you, 93 and 94, was, of course, set up to enable the CO make to be calculated. Did you know that it was done in that way?-- These two documents?

Yes?-- I wasn't aware of that.

When you suggested that it be done every day, that is, that the readings being taken every day, did you suggest that they be taken in this way: that the CO make be taken and the wind velocity be taken - sorry, that the CO in parts per million be taken and the wind velocity so that the CO make could be calculated?-- No, I specifically requested for daily Drager readings to be taken.

So, in fact it was Jacques and - perhaps a combination of his approach and the system that was already in place for the calculation of CO make that ended up producing these documents that were really designed to table and to graph the CO make?-- It does appear so, yes.

But from your side, not being a CO make man, if I can put it that way, what you were looking for was the parts per million?-- That is correct. What I was trying to achieve in getting daily readings - and in actual fact George Mason went a step further than that and introduced a system whereby we got readings every shift - what I was wanting to establish was the relationship between the parts per million the deputies were receiving with the parts per million that the Maihak was giving. As I said earlier, there was a chance it may well be that when I was looking at the 8 parts on the Friday and thinking, "This might be wrong.", I had it in my mind also that the Maihak could be wrong, so I needed to get a feel for - to be able to compare parts per million manually with parts per million electronically.

And you didn't - I mean, you mentioned George Mason's direction. George Mason gave a direction that deputies were to take readings, including wind velocity readings, every shift?-- That is correct.

And obviously that was with a view to calculating the CO make?-- That is right.

You didn't really follow through to see that the system that George Mason had sought to establish was being carried out. You didn't do that because really you didn't see that as being significant; is that so?-- As I said earlier, I didn't relate to CO make in terms of litres. I was aware that other people were thinking that way, but I had in my mind the image that assuming the ventilation velocity is stable, the shape of a graph of CO would be the same shape as parts per million. I do accept that the velocity does vary.

Okay. Did you know the terms of George Mason's direction?-- Yes.

So, you knew that what he was seeking to achieve was a shift by shift reading?-- Yes.

With a view to calculating CO make?-- That is correct.

Did you leave it to him then to ensure that that direction was followed or did you take some steps yourself to see whether that direction had been followed?-- I did not take any steps.

Well, we know now that the system really wasn't followed for very long. I mean, if you look at that document there, you will see that the last set of entries on the table was on Tuesday the 26th?-- It does appear so, yes.

And in fact the last day plotted on the graph is Sunday the

24th?-- Yes.

Did George Mason discuss with you at any time whether he was following that system through or whether the system had been abandoned, or was it just a matter that was never -----?-- I cannot recall any conversation with George Mason in respect to this.

It was never raised between you again?-- I do not recall, no.

Now, you remained as the manager for about two weeks after that; is that right?-- I remained as manager until the 31st.

31 July?-- Yes.

Now, it seems from what you have said that the way that you followed through was to read the deputies' reports and look at the parts per million. You say at least you read the night shift report, you think you looked at day shift reports and afternoon shift reports?-- Yes, and I do remember during that week, during the first few - two days probably Bob - I asked Bob Newton verbally as he came out, because I was there when the shift ended and he came into the office, "What'd you get on your Drager this morning, Bob?", and invariably it was six and six, and in fact as the week progressed he used to just call out to me without me asking - he used to anticipate, "Gidday, Joe, six again."

When Albert Schaus came back on 1 August, were you at the mine?-- Yes.

Did you have any discussions with him about what had occurred while he was away?-- Yes.

As part of that did you discuss this event on 22 July and this system that was established?-- I do not recall discussing that with Albert at that time, no.

So that your procedure of checking on the Drager reading reports really came to an end at about the time that you finished as manager, or did you continue to maintain an interest in the Drager reading reports coming out of 512?-- Well, my statutory responsibility ended at that time, but by habit I was still sort of looking at the screen.

Looking at the screen. What about the deputies' reports, did you continue to look at those after Albert Schaus came back?-- I cannot recall. Maybe I did; I cannot recall.

Well, we know now that if this chart system and graph system that are evidenced in 93 and 94 had been continued right through until Saturday, 6 August, that there would be readings on there that would indicate quite a sharp upward trend?-- I am sorry, you referred to 93 and 94.

93 and 94?-- Sorry.

Exhibits 93 and 94?-- I beg your pardon, I'm sorry.

There would be readings on there that would show a sharp upward trend in that CO make towards the end of the period, in particular during the week prior to Saturday, 6 August?-- Yes.

If you had been aware of that, was that something that would have caused you concern during that week?-- As I stated earlier, I have not seen that data or that graph before. I have seen, and I do remember seeing, the weekly graph and tabulation provided by the ventilation officer which pretty well shows to some extent the same information, or similar information.

Well, what I am asking you is if you had been aware of that during the week prior to the explosion, what effect would it have had on you to see this upward trend in the CO make? I am just interested in - given that you have said that CO make didn't mean a lot to you, just interested in what response it would have provoked in you?-- Looking at the graph, yes, there was a rise in trend, but I did not see the rate of rise all that much different from the rate of rise right throughout the extraction panel.

Now, what about in terms of the parts per million? If the witness could see Exhibit 109, please, Your Worship. At what sort of level would you have been caused concern in relation to the parts per million of CO? Again, I am trying to gauge - since you are a person who would have relied on the parts per million - I am trying to gauge what it would be to you that would indicate there was a problem?-- As I have tried to indicate before, my main monitoring tool was the Graham's Ratio, not specifically parts per million.

But you say that you did keep an eye on the parts per million when you were looking at the reports. Was that simply to compare it with what you were seeing on the Unor system or -----?-- Yeah, I think I have explained before I wanted to make sure, or I wanted to be aware if there was a discrepancy between the Maihak parts per million and the Drager parts per million, and throughout all that time I was also observing the Graham's Ratio.

Was there any point at which the Graham's Ratio caused you any concern?-- As far as I can recall, for many, many weeks the Graham's Ratio did not significantly change between .08 and .1.

And that didn't cause you any concern at all?-- No, it did not.

Now, I want to ask you about events during the week prior to the explosion. This in fact will be the first week after Albert Schaus was back in the chair, that's 1 August onwards. Do you recall yourself being at the mine on any occasion when the siren sounded as a result of a high CO reading in the 512 Panel?-- No, I do not. I did not experience that.

I think you mentioned earlier in your evidence that the siren didn't really sound all that often?-- That is correct.

Could the witness see Exhibit 127, please, Your Worship?

I just want to ask you about a number of alarms that appear. It is actually - the first of them is the sixth entry on that sheet, which shows an alarm at 1 minute past 6 on 2 August; do you see that?-- I do.

Now, it wasn't acknowledged until 9.54, but was the occurrence of that alarm ever mentioned to you? I mean, you had specific concerns with safety at the mine. Was the occurrence of that alarm ever mentioned to you?-- No, sir, never.

Could you have been the person who acknowledged that alarm at the Unor system?-- I was not.

The one on the next line, on 3 August, that's the Wednesday of that week?-- Yes.

At 9 minutes past 11?-- Yes.

When the CO reached a set point value of 8?-- Yes.

Were you ever made aware of the fact that that alarm had occurred?-- No, sir, I was not.

Do you recall any siren sounding on that day?-- No.

If a siren had sounded on that day, do you think you would remember it now?-- On the 3rd - and we are speaking of the 3rd now?

Yes, the 3rd?-- On the 3rd, which I believe was the Wednesday, I left Moura mine at approximately 10.30, 11 o'clock and rode to Gladstone to get a flight to Brisbane for company business.

You didn't go back to the mine that day?-- I did not get back to the mine until approximately 11 a.m. on the 8th, the morning after the incident.

Right. In that case, you couldn't have heard any sirens on the occasion of the next alarm on the 5th or either alarm on the 6th; is that right?-- That is correct. I was not there.

It certainly wasn't you that accepted any of those alarms or acknowledged any of those alarms?-- No.

Has anybody ever mentioned to you that sirens sounded as a result of an alarm on the Unor showing a breach of the CO level in the 512 top return during that week?-- No.

Never been said to you by anybody, "Oh, look, we did have a couple of alarms during the week."?-- I did not hear anything in connection with alarms until I have been present in this Inquiry.

Just a few quick matters: were you at any time in a position where you needed to be aware of the state of the ventilation within any particular panel of the mine because of some safety concern or otherwise that fell within your jurisdiction?-- No, ventilation wasn't part of my normal day-to-day duties.

Did you become aware of what sort of plans, if any, were kept of ventilation in the panels at the mine?-- Could you please define what you mean by "plans"?

Well, something that shows the current state of ventilation in a panel and which is updated whenever ventilation changes were made. Was that a matter that ever arose in connection with any safety issues, or, for that matter, in connection with any other duties that you carried out at the mine?-- When I was on shift - shift undermanager - that is, from March to December of 1992 - I instigated a whiteboard in the undermanagers' office because, being new to the mine, I did not have an understanding of what equipment we had at the mine in terms of how many PJ vehicles did we have, how many Eincos did we have, how many MPV's, and the various other equipment, so I instigated a whiteboard where we listed down the equipment that we had and we instituted a system of recording at the end of every shift the status of that machine; this particular machine is in the workshop, this particular machine is in 6 south, this machine is whatever, and towards the bottom of that board we had built in a system of recording regulators; for example, 510 bottom regulator, 510 top regulator, and we would write in the status - half open, or whatever the status was. Is that relevant to the question?

That would show you the state of the regulators, what, in every panel?-- It would show the status of the panels that were currently being mined at that time - the relevant panels.

And was that upgraded from shift to shift? I mean, I know you say it was a system that you established?-- A lot of it depended on the undermanager changing it to update it and a lot depended on the deputies informing the undermanager of the changes, I suppose.

Did you follow through at any time to see whether that system was working?-- I cannot say that the system worked perfectly 100 per cent, no.

No further questions, thank you.

CROSS-EXAMINATION:

MR MORRISON: Mr Barraclough, you mentioned to Mr Clair a couple of times that your main monitoring tool when it comes to CO monitoring was use of the Graham's Ratio?-- That is correct.

And did I understand you correctly to say that that was something that you had learned while you were being educated in the UK?-- Yes, many years ago.

Well, can I just ask when was that you obtained your qualifications?-- My studies in the UK were between 1950 and 1958.

And was it then that you got a first class certificate?-- I obtained my first class certificate in 1958, yes.

And when you came to Australia, did you get another certificate or an upgrade or an Australian certification of your qualifications?-- When I arrived in Australia I requested the mines - sorry, the Board of Examiners if I could have my first class certificate, UK, recognised in Queensland. I was advised that I would have to study the Queensland legislation relating to coal mines and then undertake an oral examination.

Did you do that?-- I undertook an oral examination with a mines inspector and subsequently obtained a Queensland first class certificate.

Can I just ask you this: when you approached the inspectorate in order to get a certificate out here, did you have in mind then where you would be working; that is to say, somewhere in Queensland as opposed to somewhere else?-- I just wanted to make my status current, wherever I may be. I didn't know what my future was going to be; whether I was going to be in Queensland forever or move into New South Wales, or whatever. I just wanted to establish my status.

Sorry, I probably didn't make it clear. What I was interested to know was when you did approach them about getting your endorsement here, did you know, for instance, you would be at Collinsville as opposed to Ipswich, or-----?-- Yes, sorry, yes.

Did you make that known to the inspectorate?-- The inspectorate knew that I was employed at Collinsville at the time. I never - that sort of discussion dialogue never took place.

But they certainly knew where you were employed?-- Yes.

Can you tell me was any part of the examination that you were given - did any part of it relate to spontaneous combustion?-- I cannot recall the oral questions that were asked at the time. I cannot recall that.

You can't bring to mind now any that fit in that category?-- No.

Is it possible that there were none?-- Sorry, I just - it is possible that there were none. It is possible that there were some. I just cannot recall, I'm sorry.

You mentioned that you were at Collinsville in a number of capacities, and then on to - when I say "a number of capacities", in management type capacities - manager, undermanager and superintendent?-- Correct.

You didn't work as a miner at Collinsville at all?-- No, not at all.

Nor, for that matter, at Moura?-- No.

While you were at Collinsville, did you engage in any activities, say with Mines Rescue?-- I was not an active Mines Rescue member in terms of I did not wear the suit and do all the training exercises as a brigade member. I was, whilst manager at Collinsville, on the Queensland Mines Rescue Management Committee covering the Collinsville district.

And how many years did you remain on that committee?-- Probably two - probably 1982 to 1984, maybe 1981 to 1983. It is something in that region. Certainly no more than three years.

You said that you weren't donning the suit and so forth. Had you been an active Mines Rescue person before that in the UK?-- Yes, I was a Mines Rescue active member in UK from, oh, 1954, or thereabouts, until 1960.

And if I can come back to Queensland, then? Apart from being on the management committee, did you have some other responsibilities which you carried out in relation to Mines Rescue?-- During my time in Collinsville we had two simulated exercises - probably what you could call "mock exercises". They were initiated by ourselves - "ourselves" meaning management at the mine and the company - people at the mine - the management and the company - where we were attempting, like competitions, to test the competency of the rescue people. I spearheaded, organised and led the first of those simulated exercises, which was to simulate a methane explosion caused by an electrical fault in a continuous miner. The second simulated incident was when I was mine manager and the simulation exercise was that there had been a CO2 gas outburst, and rescue personnel were required to assist in recovery.

And in terms of - that's the Collinsville mine itself - in terms of any activities that Mines Rescue did - competitions and the like - did you have some involvement there?-- Yeah, I travelled around the state with the teams on competition work and I would assist assessors in going underground or even on the surface and assessing, probably by tick-sheet situation, how people performed on a specific part of the exercise.

And did you continue that sort of activity - that assessing activity over any particular time that you can recall - a number of years, or-----?-- I think my involvement with the Mines Rescue probably ended when I left the underground part as a full-time - when I left being 100 per cent at the underground and moved into the wider area, including the

open-cut. That's about 1984.

And you mentioned, I think, you assessed about 85 per cent of your time was taken up with the open-cut?-- That is correct.

And was that throughout that time period - '84 through to - I think it was '91 when you left?-- That is correct.

While you were there at Collinsville, did you undertake any courses in relation to - or were any courses available to be undertaken in relation to spontaneous combustion, mine fires, that type of thing?-- Not that I can recall.

And can I just ask you to be clear about the two categories: (1) did you undertake any; (2) can you recall whether any were available?-- I think the answer to both is I just cannot recall.

In terms of your knowledge about spontaneous combustion and so forth, from where does that derive?-- It derives from my studies in UK and experience since those studies.

Well, those studies in the UK were for your qualifications - your formal qualifications and your ticket as a first class manager?-- Yes.

And did it also come from Mines Rescue training over there? Did they deal with that sort of issue in Mines Rescue training?-- Yes.

And you mentioned your training out here. Now, when you got to Moura No 2, you conducted inductions for new employees, you were telling us?-- That is correct.

And part of that induction material included information about spontaneous combustion?-- Yes.

And you mentioned there were hand-out notes or sheets?-- That is correct.

Were they drawn up by you, or were they provided from one source, or-----?-- No, they were - as I've explained to Mr Clair, the induction package was supplied by the Queensland Coal Owners. Each package, and we'll take the one, "Fires, Explosions and Spontaneous Combustion", was no different from any others, and I use that as an example. The package contained lecturer's notes, overhead projector slides, trainee handouts and trainee assessment sheets.

I will ask Mr Barraclough to look at Exhibit 39. Do you recognise that document?-- That is the document supplied by the Queensland Coal Association entitled "Fires , Fire Fighting and Explosions". I recognise it and that was the package that was used to cover that particular subject in basic induction training.

In that document will we find the trainee hand-out notes?-- Yes, they are there.

As well as copies of the overhead projection material?-- The overhead slides are contained in that part of the document.

Which is entitled what?-- "OHP Slides", and then there are a series of-----

Is this the module that was used for inductions?-- That is correct, basic induction.

Thank you. You can hand that back. Now, apart from your courses which you did in the UK to get your ticket in the first place and your professional qualifications, did you undergo some other training courses in relation to advancing your own knowledge and experience?-- At the time that I obtained my first class certificate, mine manager's certificate, I also obtained a National Diploma in Mining Certificate and graduate entry into the Institute of Mining Engineers. That was all around 1958 and then in -----

The precise year probably doesn't matter?-- Some years later in 1965 or '66 I undertook a post graduate degree in personnel management.

Can I just ask you to look at this document? Have you undertaken a number of courses about - training courses, safety and occupational health courses and the like, and that's since you've joined BHP?-- That is correct. I have undertaken all these courses since I joined BHP at Moura.

Without going to each one in detail, Work Place Training and Assessment, that's the train the trainer program?-- That is correct.

And then the advanced train the trainer program?-- That is correct.

Do I take it correctly from the names that the purpose of those courses is actually to produce people who can teach others?-- That is correct.

Then supervisors' responsibilities, various safety courses?-- Yes.

Designated by BHP?-- Yes.

I tender that document. I will produce copies for everyone later on.

WARDEN: Exhibit 167.

ADMITTED AND MARKED "EXHIBIT 167"

MR MORRISON: Can I just turn to some of the aspects to do with training? You mentioned at one stage the safety committee that you were on with a number of other people; do you remember that? Mr Bryon was one?-- Yes, I do remember.

You might not have said Mr Bryon, you said the check inspector. I think that was Mr Bryon, wasn't it?-- On the safety committee we had two. We had the two check inspectors. There were two check inspectors at the mine and they were both

on the safety committee.

Just so that we understand what we are talking about, what is "check inspector" exactly?-- A provision in the Mining Act states that employees at any mine may elect two persons to represent their interests in connection with safety, and the check inspectors have the power to inspect any part at the mine and do other things.

They are not management appointed?-- No, no, they are union - they are employees, members of the union, and the check inspector's position is an elected position.

In your experience at No 2 Mine, how did those check inspectors go about performing their duties in terms of safety issues particularly? Were they reticent about coming forward or did they speak out what they wanted to speak out about?-- Both Steve Bryon and Terry Vivian, the two check inspectors in question, were both very vocal and forthcoming in whatever venue was appropriate to make whatever point they wanted to make.

Is that a comment that can apply beyond just them to other miners?-- The management door and the management ear was always open. I believe we had first class communications at Moura mine.

Notwithstanding that the door was open, did people actually avail themselves of that? Did they come and voice their concerns, whatever they may be?-- They certainly did.

And we are now here talking about not just check inspectors, just general miners as well?-- That is correct.

Can you tell me, please, about the set-up of the committee system at Moura No 2? The safety committee you referred to was only one part of it, I think?-- That is correct.

Can you tell me then about - go from the top down in the committee system, the hierarchy?-- Some time during 1993 - certainly 1994, but I think it may have been initiated in 1993, BHP took the view, and this was not just at Moura, but I believe this occurred right across the whole spectrum of the BHP Coal operation, they took the view that out there in the workforce there is a tremendous amount of skills and knowledge, ideas that were probably locked away in peoples heads and advantage wasn't being taken of it. BHP came to some agreement with the unions, and I think - I mean unions plural - that we should establish some means or some system whereby we can get together, explore those ideas and experience, let's set targets and be seen to pursue those targets so that the operation will improve, and that agreement also included that if improvements could be brought about by that process then monetary rewards would be forthcoming in terms of -----

Pay rises?-- Wages, pay rises or whatever.

Well, what followed from that decision, that agreement with

the unions then?-- A number of committees were formed to sort of manage and monitor and control those objectives. The committees - we had a number of committees and I remember one being called the production committee, obviously that was designed to sort of bring about improvements in production. We had a cost saving committee. We had a productivity committee. We certainly had the safety committee and -----

The training committee?-- We also had a training committee, yes, sorry, and action plans were set and activities were aimed at achieving those action plans.

On all of those committees that you've mentioned were miners represented in their own right as well as trades persons and management?-- All unions, and to try and put that into perspective, the electrical unions, the mechanical unions, the miners unions and the staff and management people all had representatives on all of the committees.

Was there one committee that was, as it were, at the top of the hierarchy?-- Yeah, we had - the whole process was called Mine Consultative Committee which abbreviated was MCC, so that from that we had the MCC safety - sorry, we had the MCC management committee which overviewed the whole process. Below that MCC management committee we had the MCC safety subcommittee, the MCC safety - production sub committee -----

And all the other ones that you've named. On the Mine Consultative Committee, the head one, were miners represented on that too?-- Yes, miners, trades people and management people.

Would any of those committees consider safety matters in addition to any considerations the safety subcommittee had specifically?-- Yes, there was some cross pollination because some of the things that the safety committee were pursuing was not different from what some of the other committees were pursuing, and I can probably give a good example of that.

Well, what is that?-- The safety committee were concerned about the manual handling injuries that we were experiencing and we were pursuing initiatives to try and reduce the amount of handling that people had to do in relation with the gopher machine. The gopher machine is a machine that is very awkward to handle and its purpose is to install roof bolts, and we had quite a number of injuries resulting from handling of the gopher. A line to our thoughts in that matter, and I can't remember whether it's a productivity committee or whether it's a production committee, they were pursuing mounting the gopher on to the continuous miner. So the example is that we have two committees that were looking at a problem from two different aspects.

But no committee was debarred from considering the safety aspects of whatever it was they were considering?-- That's correct, and each subcommittee did report back to the major management committee on a regular basis as to its status in connection with its action plan.

On the consultative safety committee, the one that you were on specifically, what was its purpose or function as it carried out?-- Its purpose in the ultimate was to achieve zero lost time injuries.

That would be a perfect world?-- Yes. That was the aim, that was the mission that we set ourselves.

What would it do in terms of its work? Would it review injuries or accidents? Was it reactive or pro-active or both?-- It was a mixture of both. When one reviews accident statistics obviously one is looking after the events, or in some respect you can say that is reactive. We did pursue safety statistics and we did develop action plans after analysing the types and causes of accidents. As I explained, I think in an answer to a question from Mr Clair, we were pro-active in the sense that we would do surveys in connection with, and the example I used was the safety clips in connection with high pressure hoses. There were others like, for example, people were smoking in the lamp room and we gradually reduced that to zero just by coercion and peer pressure that - members of the committee were doing the policing role.

This included those members who were ordinary miners and check inspectors as well?-- Correct, correct.

In the work of the consultative safety committee, that is the subcommittee dealing specifically with safety, can you tell me this: in your time involved with that committee or indeed at No 2, did anyone raise as a safety issue whether men should be down the pit after a sealing?-- No.

Not the check inspectors?-- No.

Or the miners?-- No, no. That was never raised.

Can you recall it ever being raised for the consideration of any other committee, if it wasn't specifically a safety issue? Can you recall it being raised for anyone else?-- No. It was never raised.

I'm about to move to a quite different point, Your Worship.

WARDEN: Yes, it's getting close to the time. Thank you, Mr Morrison. We will take the lunch adjournment now. Resume at 2.15.

THE COURT ADJOURNED AT 12.56 P.M. UNTIL 2.15 P.M.

THE COURT RESUMED AT 2.18 P.M.

JOSEPH BARRACLOUGH, CONTINUING:

MR MORRISON: Mr Barraclough, before lunch I was discussing with you the formation and general hierarchy of the various committees on which personnel were represented at Moura Mine; do you recall that?-- I do, yes.

And also the general nature of the constitution of those committees in terms of covering miners right through to management?-- Yes.

Can I take you to a slightly different topic now, if I may, and that is to the aspect of training? Now, you mentioned in relation to training of personnel before statutory requirements. Are they in Part 59 of the Act?-- They are in Part 59 -----

Could you just hang on a second? Can you respond now?-- Yeah, they are in Part 59 of the General Rules for Underground Coal Mines.

And as you understand it, are you, under those rules, required, or at least the management required to implement a scheme which complies with those rules and is approved by the Chief Inspector?-- Yes, that is correct.

Did you have available to you a document dated 1 May 1991 which had been issued by the Chief Inspector?-- I did, yes.

And was that an approved scheme of personnel training?-- I believe that the heading or the title on that document said words to that effect, yes.

"Approved Schemes of Personnel Training in Underground Coal Mines"?-- Yes.

In relation to the training which you embarked on at Moura No 2, can you make a comment about whether or not it fell within the guidelines of those approved schemes?-- Sorry, I missed the first part of your question.

In relation to the training that was carried on at Moura No 2, are you able to make a comment as to whether or not it fell within the general guidelines of that approval document?-- Yes, that is so.

At any time did you receive any other letter, notice, requisition, form, any sort of document or verbal communication from the Chief Inspector or any member of the Inspectorate requiring additional or other training?-- Not that I can recall, no.

Did you have visits from the Inspectorate from time to time?--

The mine did have visits from the Inspectorate, yes.

And was it always a particular inspector who came?-- I recognised Mr Mike Walker as being the inspector for the Moura district. I do recall possibly when Mr Walker was away Mr Evans, who I think was based at Brisbane at that time, probably covering during Mr Walker's absence.

And no doubt there were inspectors for the electrical and mechanical side of things too?-- That is correct.

On occasions when inspectors did visit the mine, did you have cause to talk to them?-- There was no set protocol that that would occur, but as a matter of being social I would say, "Hello, gidday.", and have a chat, probably discuss current affairs and things, along with, for example, the mine manager.

Was the topic of training and whether the training was adequate or whether it met the regulations ever raised with you on one of those occasions?-- I do remember when I was acting manager Mr Walker arrived at the mine - I just forget the date now - Wednesday or Thursday in July, 25, 26, 27, something like that. I was acting manager and during - before our visit underground we sort of were chatting generally and I do remember raising, or the subject being raised of our intention or our objectives of lifting the awareness, the general awareness, of people's perceptions in connection with safety. We did discuss steps that were being taken to pursue that objective.

Is that the only occasion you can bring to mind when a member of the Inspectorate has raised with you training levels or adequacy of training levels and so forth?-- Yes, I believe so. On that date also we did have a lady consultant physiotherapist present at the mine and she was there at our invitation to observe men at work underground, and the proposal - the idea was that we asked her to put a proposal together so that she could train our people in ergonomics of handling equipment and so forth, and during those conversations Mr Walker actually had discussions with that lady.

I will just ask you to look at a document very quickly and you might be able to confirm the date when this occurred. Having looked at that, are you now able to recall which date it is?-- Yes, this is the inspection made by Mr Mike Walker on 27 July.

Just hand that back for the moment. I want to stay with the training scheme for the time being, if I may. It had a number of categories to it, I think, is that right, dealing with inductions and then with other areas?-- Yes, that is correct.

Well, can you tell us what they were? There was induction of new employees, you told us about that one earlier?-- Yes.

What else was involved in that training scheme?-- Are you speaking specifically in connection with refresher training or training in general?

Training in generality?-- What I am referring to now is the document which Mr Clair referred to and that's the attachments to my statement to the Inspectorate.

The five page list of items?-- That is correct.

I wasn't so much interested in those because you had really dealt with those with Mr Clair?-- Sorry.

Can I just ask in a few areas - you mentioned induction of new employees?-- Yes.

Was there training on equipment?-- Training on equipment for non-authorised people to become authorised was an ongoing thing. It was happening every day, every shift every day.

And then you have mentioned before earlier to Mr Clair refresher training?-- Yes.

And then was there, as it were, the ad hoc training as the need arose, training that cropped up?-- Yes.

Now, you mentioned to Mr Clair that you kept records detailing who had done what in that training scheme?-- That is correct.

In spread sheet form?-- Yes.

Could I ask you to look at Exhibit 40, please? This is the document that's been produced from time to time here. Do you see that document?-- Yes.

Is that what you referred to as merely an extract from the spread sheet?-- This is an extract from my total data base spread sheet, yes.

Is it confined really to people who were witnesses in the Inquiry?-- That is correct.

The spread sheet itself, how does it compare in size and detail with that?-- This spread sheet - this extract was prepared at the request of - I forget who, probably Mr Walker, I don't know, showing the training records of witnesses that were proposed to be called at the Inquiry.

How does it compare in terms of size? Is the spread sheet the same sort of size or is it a much larger document?-- This particular exhibit, Exhibit 40, only covers the items referred to as refresher training items.

So the spread sheet covers other items as well?-- Very much so, yes.

And more employees as well?-- Yes, correct.

You can hand that back. In relation to inductions for new employees, you saw earlier the module that you identified as the one being used for inductions?-- Yes.

There were different categories of inductions, I think?-- Yes, that is true.

And how would you determine who got what?-- The three categories, I think - if I can remember correctly, the three categories of induction that we had was the Queensland Coal Association induction which covered something like 19 or 20 different modules and different subjects; there was a contractor's induction designed to be specific to people who were only going to be employed for a matter of hours or maybe a day or maybe two days, for short periods of time, and then there was a visitor's induction which was designed for people who would probably be underground for no longer than two hours.

Now, in terms of an induction for someone who had previous underground experience, how long would they spend undergoing that induction?-- For people who had been employed in Queensland mines prior to joining Moura, the induction would be something like four or maybe five days.

And for those people who hadn't been underground before?-- The induction would be 10 days or thereabouts, possibly more than 10 days, depending on their performance in the written assessment after the induction.

Now, you mentioned 18 or 20 topics covered in an induction, or potentially covered in an induction. Would they vary according to what induction one was undergoing?-- The 18 or 20 modules were for people who had never worked underground before and were destined to become full-time members of the workforce.

What sort of topics - can you just give us a few examples of the sort of modules - topics for the modules?-- Self-rescuer, W65, contraband rules, special rules relating to duties of all persons, roof control, belt conveyor safety, compressed air safety, hydraulic safety.

So on and so on. And for those who had some experience before, would some of those topics be dropped out if they had already effectively had them before?-- That is correct. For example, if we recruited a fitter who had been employed at some other mines, it may be that he would not have to undergo hydraulic safety and principles, for example.

Now, how did one go about conducting the induction course itself?-- I was the primary tutor and instructor. When a training session was scheduled to occur, I drew up a schedule trying to cover the entire 10 days and identify when some of my substitute tutors would be available. For example, our occupational health and safety nurse would do the first-aid module on my behalf. Phil Draheim, the geologist, would do the basic geology module. So, there were a number of people qualified in certain subjects that would assist me to do certain modules, and I would draw up a schedule based on their availability on whatever day they could fit in with the schedule.

Was Mr Kerr one of the people recruited to help out in inductions?-- Yes, Mr Kerr covered the subjects of mine gases and detection equipment and also the subject of Mines Rescue.

Those people who helped you out, did they have to have a certain standard, or be of a certain category in order to be authorised by you to help out?-- There was no requirement as to the standard of the tutors, but I followed the premise, the established premise, within the educational system that says that people not - people shouldn't lecture or tutor on a subject in which they were not qualified themselves.

Now, in terms of conducting the course itself, where was it conducted and what sort of aspects did it have, lectures as well as practical, that sort of thing?-- Yes, what I would like to - what I usually did, in the first two days I would try and cover the basic subjects that were relevant to a visitor, for example, contraband, self-rescuer, how to conduct yourself underground and the basic things that probably visitors needed to know. Then we undertook a trip underground whereby I could point out the terminology that we would be using for the rest of the induction course; for example, "This is a prop, this is an overcast, this is a conveyor belt, this is brattice, and we will be talking about these things over the next 10 days."

Were there demonstrations by those who conducted the course?-- Were they given demonstrations?

Yes?-- Yes. One of the subjects, for example, was firefighting, and Allan Morieson, being the fire officer, undertook to take that particular module for me, and he would demonstrate firefighting appliances, fire extinguishers, hoses and such like, and then the students themselves would be given a practical skills audit in the use of that equipment.

Now, that practical skills audit, was that for every topic?-- No, no, that one was specific for firefighting.

But for other topics was there a practical skills audit for those as well, those that had a practical skills application?-- Most of the subjects had assessments, either written, theoretical or practical. For example, knowledge of contraband not allowed underground is a written rather than a practical assessment. First-aid, for example, is a written and a practical assessment.

In terms of the record that was kept of an induction as well as formal training, was there a log kept for each employee?-- Yes, there are.

And would that include details of the induction completed?-- Yes.

As well as copies of the assessment and skills audit?-- Yes.

And the assessment made of that employee by the trainers?--

That is right.

Is that maintained as a file for every employee on the mine site?-- That undertook induction during my time, yes.

Now, if we turn to the second area that I raised with you before, that is to say, equipment, training and authorisation, can I just ask you about that for a moment? Is it the case that one has to be authorised by the manager if one is to operate equipment in a mine?-- That is a legal requirement, yes.

And were you involved in ensuring the training of those who were to operate equipment?-- Yes, I was.

Could you tell me how that was conducted?-- I would relate with the training committee and develop guidelines as to who was to be trained on what equipment. We had somewhat of a seniority system. I would do a - I did research well in advance of the time a person was to do training and identify if he wished to be trained. For example, I would approach a person in the manner, "Bill, you are getting towards the top of the list for training on the Eimco machine. Are you interested?" The answer would be "yes" or "no", so I knew where I was coming from. When it got time for the person to be trained, the first thing that we did was to ask him to fill in a stat dec, statutory declaration, which is a legal requirement to say that he didn't suffer from any disabilities that would endanger him - endanger himself or other people whilst operating that machine; I had to satisfy myself that he had had a medical examination in the preceding five years, and then someone would then put him through the theory, the manual on which that training is based. That someone would be either myself or one of the people that had been trained as train-the-trainer.

And that would be conducted in a classroom situation?-- Well, that was partly classroom and partly on the machine, not necessarily moving the machine; in other words, "This is the lever to lift the thing up, this is the lever to swing it to the left, this is the lever to swing it to the right.", and sort of a visual examination of the control functions of the machine.

And would the candidate, if I can call the person that, then have to undergo an assessment on - a written theory assessment?-- Yes.

And if you didn't pass the written theory assessment, would it stop there and you could try again?-- It would stop there and then we would start - go back to stage one and start all over again.

In terms of actually using the equipment, were you allowed to do that before you passed the theory?-- No, no. Each - I think there was what I call the seven steps in training, and you could not proceed to the next step until the preceding steps had been completed.

After having got through the written theory assessment, would you then let the candidate go on on-the-job training?-- Yes.

And who would conduct that?-- Well, at that stage, having satisfied myself that the person had done his theory and I had the documentation of his assessment successfully completed, I would then ensure that person's undermanager was aware that this person was now ready to do hands-on training under instructions with an on-job instructor, and then it was left then to the undermanager to bring the triangle together. I used to call it the triangle. That's the availability of the machine, availability of the trainee and the availability of the on-job instructor.

And then would that person undergo a period of time, however long, of actually operating the machine under the guidance of an expert?-- Or experts. It wasn't necessarily one instructor, it could have been a number over a period of time.

And then, as with the other areas, would someone other than an on-the-job trainer assess him as to whether he acquired the necessary skills?-- Yes, every time a person was undergoing training, every shift there was a personal log filled in where the trainee himself wrote his name on the sheet saying, "I have spent five hours today operating this machine under instruction." The next part of the form would say, "I have been an instructor and I have instructed this man today and he is performing well, poor, he requires more training.", or whatever comments might be appropriate. At some stage in the training I would then receive on that document a statement which would say, "Ready for assessment." "Ready for testing." Having received that document, I would then make arrangements for test papers to be made available and one of the trainer people would then conduct the test on a pro forma assessment sheet.

And if one passed, you would then get authorised by the manager, and if one failed, you would go back to the previous step?-- That is correct.

And the documents recording an employee's progress through that system, were they retained on his personnel file, along with the others we have discussed?-- Yes, they were kept on his personnel file held in my office.

And authorisations, were they kept on file as well?-- Yes, they were.

And posted as well?-- Sorry?

And posted?-- No, no, when a person had been tested on a machine, I got the mine manager to sign an authorisation in duplicate. One copy of the authorisation was issued to the operator and the other was held on my filing system.

And was there a record of all authorisations posted on notice boards?-- Yes, there was always a series of postings, both on the assembly area notice board and also in the undermanagers' office, so it was easily recognisable by a code as to who was authorised to drive what machine, who was training on what machine.

The next category that you identified before was the third in the series; induction was one, equipment training and authorisation, and then refresher training, which you touched on earlier with Mr Clair today, and in relation to that are there some items that are in the improved scheme by the chief inspector which are required to be met under refresher training?-- Sorry, Mr Morrison, could I ask if you could repeat that?

Sorry. Are there items in the improved scheme which is issued by the chief inspector which are required to be covered by refresher training?-- Yes, there are.

And are traffic rules and use of the rescuer a couple of those?-- Yes.

In relation to refresher training at Moura No 2, did you have a number of sources from which to draw the perception of a need for training in some area or in relation to some aspect - refresher training?-- Yes, identification of training need was based on a number of things. One might be, for example, cable flashes. A cable flash is a dangerous situation. If it is ongoing, we must take steps to eliminate it, and that would be a training need - for training to become adapted in that area. Other training needs might be assessed or identified by purchase of new equipment or changes in systems, or introduction of new systems.

Which, by their very nature, throw up the need to know about or be trained on the new equipment or-----?-- Yes, anything new, any changes identified a training need.

Could you get identification of training needs out of the safety committee meetings that you have referred to?-- Yes, the safety committee was a very active committee and we did identify a number of areas under which training needed to be performed.

Were there also staff safety meetings held?-- We used to hold mass safety meetings at the mine where we attempted to capture every employee on duty on a particular day, and those meetings were duplicated over four occasions; that is, we caught the day shift, afternoon shift, and night shift and then we caught the people that were missed or at a different time on another occasion.

Who would conduct those meetings - that is, the mass safety meetings?-- Albert Schaus and myself would, some days before, sit down and consider the topics that needed to be raised at that meeting. In other words, we would draw up an agenda and the conduct of the meeting was jointly led by Albert Schaus, George Mason and myself.

And with what regularity were they held?-- Somewhere in the region of between four and eight weeks.

And were minutes kept of those meetings?-- They certainly were, yes.

And were those minutes circulated?-- The minutes were circulated to all members of staff, notice boards outside the assembly area, notice boards in the work shops and in the crib rooms - crib rooms on the surface and underground - and to members of the safety committee.

Could you just have a look at Exhibit 78, please? You will probably confirm for me that these are the minutes of the safety meetings held on 16 and 17 June 1994?-- That is correct.

And are they circulated in this form - notice boards, crib rooms, etc?-- It is stated on the top of the first page where copies are distributed to, yes.

Now, if we look down - about half-way down the page there is

an entry "J Barraclough presented"?-- Yes.

There were some statistics presented by you?-- Yes.

And if you turn over the page to page 2, about a quarter of the way down the page, there was a reference to Mr Schaus showing safety statistics?-- Yes.

If you turn over two more pages, please, you should come to a page showing a series of mini graphs?-- That is correct.

Now, are they the statistics for safety performances and lost time injury rates and so forth?-- Yes.

Are those statistics correct?-- They are correct, yes.

They show a continually improving situation?-- That is correct.

You can hand that document back. At the mass safety meeting, apart from the matters on the agenda, would other matters be raised by miners, check inspectors and the like?-- Yes, the - having gone through the pre-prepared agenda, the meeting would then be thrown open to the general floor - does anyone have any points to raise in connection with safety, and those points were noted and discussed.

And was it common to get suggestions from the floor or topics from the floor?-- I would say that topics from the floor would be at least six and could be a maximum of, oh, 20 topics from the floor at any meeting.

Now, after the mass safety meeting was conducted, would that then be followed by a staff safety meeting?-- Shortly after the mass safety meetings where all these topics had been raised and discussed, there was then a staff safety meeting where we would systematically go through every item that had been raised at the mass safety meetings. Responsibility was assigned to management personnel to address each item raised. Some items may be quite simple in the fact that, "That's illegal. We can't do it anyway.", so that people were assigned to go away and address, as best they thought fit, the comments raised at the meeting. Then, some days before the scheduled next mass safety meeting, we would gather again to compile a status report as to where we were at with the responses to the points raised from the floor, and then at the next mass safety meeting, George Mason would then stand and deliver the response to all the points raised at the previous meetings.

Would they then be the topic of further discussion, or not, as the people saw the need?-- Yeah, if a topic was still ongoing and had not been completed, that was then kept on the list of things still to be attended to. The ones that were attended to, completed and reported on were then scratched off the list.

Was there a set of records maintained for the staff safety meeting minutes as well?-- Yes, there were.

Showing actions yet to be done and actions completed and so forth?-- Correct.

Out of the staff safety meeting, or even the mass safety meeting, if there was a matter of training needs raised, would that be referred to you?-- Yes, it would. The reason I hesitate is because not many training questions were raised in that sort of arena.

Yes, that's what my next question was?-- Normally it would have been referred to me had it occurred, yes.

In addition to the things we have discussed - the mass safety meetings, the staff safety meetings, the safety committee meetings - were there other opportunities for staff to interact one with the other on safety questions and training questions? I have in mind weekly tool box meetings, for instance?-- Yes, we introduced - in our attempt to continue to improve the general awareness of safety across all employees, we did introduce what we refer to as the tool box meetings - supervisors' tool box meetings. The staff safety meeting - I used to ask, "Has anybody got any thoughts on tool box meetings that we should be sort of conducting over the next two or three weeks? Does anyone have any themes? Is there anything that is sort of significant that we need to address?", and there would be ideas put forward that we should discuss this item or some other item, the idea being that each week a supervisor would be given a theme. "This week we want you to talk about anchoring shuttle car cables.", for example, and a sheet would be issued with some topic key words, and the key words were "shuttle car anchorage", it might be "distance from the intersection" and "double anchorage".

Nominated topics and nominated areas to be specifically addressed?-- That's right, and then it was left to the supervisor using his own personal style to deliver that information to the - to his crew - to his group - whether it was done on the surface, at the assembly point at the start of the shift, whether it was underground down on the job, it was left entirely to the supervisor. At those meetings there was also the opportunity for the feedback from the people to make comment. All that was recorded and then referred back to myself for action or monitoring.

On safety matters, would it come back to the safety consultative committee?-- In most cases I used to sort of look at it and then decide that was a matter that should go to the electrical engineer or that was a matter that should go to the mechanical engineer, or a matter that I could deal with or probably a matter that George Mason had to deal with, whatever it might be.

Now, obviously you could get suggestions on training or safety matters arising just from informal discussion around the mine?-- That is right.

Did that happen at all with any frequency?-- Yes, it did readily - all the time.

And another source might have been, as with Mr Walker when he visited, the inspectorate - discussions with them?-- Yes.

Did that happen with any frequency?-- The discussion with?

No, the raising by the inspectorate of any safety or training requirement or need that they perceived?-- I can only refer, I think, to the 27th when Mr Walker came to the mine - 27 July we did discuss over a cup of tea before we went underground matters of general safety and I cannot recall the specifics.

Can I just take you to another topic, if I may? You had mentioned at - when you came to Moura No 2 you had previously been at Collinsville and then before that in the UK as a miner?-- Correct.

In the UK was your experience there with bord and pillar operations or long wall?-- No, I was not experienced to bord and pillar work until I came to Collinsville.

And when you came to Moura No 2, did you develop any awareness at that time of a thing called - or a thing that's been called in this Inquiry the "incubation period" of coal?-- Yes, I was aware that there was a phenomenon called the incubation period.

And can you tell us where did you derive that understanding from and what was it?-- I think I first derived the concept from my study days. I observed both in England and Collinsville stock piles that would readily - sorry, not readily, but would combust if left over a period of time.

Did you also derive any information from the Kianga report which you told Mr Clair you read?-- Yes, I remember reading the Kianga report, not in connection with this Inquiry, but some years ago, and I do remember reading a reference to Moura coals probably having an incubation period in the region of six months.

And is that the view that you eventually formed as to the incubation period - six months?-- Yes.

And are you able to say whether, in your experience, other people held that view or a similar view?-- It certainly became evident during my discussions on 22 July with Steve Bryon and with Jacques Abrahamse and with Peter Rose, because the question - I think I asked the question, "Where are we, Jacques, in relation to the length of time we have been in 512 and the incubation period?", and Jacques' response was, "Well, we are scheduled to be finished in about three months or maybe four months, so really we are well within the period." Also we did discuss spon com during the ACIRL facilitated risk analysis, where spon com was raised as being a possible risk and the outcome or the comment in that report states that we wouldn't be in 512 very long anyway, and the risk of spon com was relatively low.

Was that comment in the Minerisk reflective of the view of

those who participated in the Minerisk Analysis?-- Yes, it was. Every conclusion that was arrived at in that Minerisk Analysis was a consensus of the whole group.

Including the ACIRL facilitator?-- Well, I don't know what experience or what knowledge the ACIRL facilitator had of Moura coals, but certainly that went down in the document as being the view of all the people present.

No dissent expressed?-- There was no dissent at all, no.

Can I just turn to another matter, and that is your familiarity with the underground parts of the mine. I'm not talking about the parts on the - above. Did you take some steps to become familiar with the mine when you first arrived, in terms of visiting underground or travelling with the manager and things like that?-- Yes. I think I must have gone underground probably twice or three times in the first week.

And thereafter did you follow that pattern of going underground every week?-- Well, I became shift undermanager probably on the second or maybe the third week I was employed in Moura and in that duty I had all the mine to traverse.

After you stopped as a shift undermanager and went on to the safety and training task, what about then?-- I sort of had my four or five week schedule, weekend duties, but in between those scheduled duties I would go underground once, maybe twice per week, three times per fortnight for a number of reasons: to keep myself informed, to check up on the training performance or to check on something that I'd heard or read, or whatever.

Now, in terms of informing yourself about what was going on in the various panels, did you have a habit in relation to that as well to do with shift change times?-- Yeah, I found that the communication systems at Moura and the layout of the buildings was ideal for first class communication. I used to arrive at the mine at about 5.45 and that never changed irrespective of what duty I was doing - whether I was shift undermanager, whether I was safety training undermanager or whether I was acting mine manager. That was always the situation. I arrived 5.45 and went straight to the undermanagers' office.

What was happening there?-- Well-----

Routinely, I mean?-- Things used to start getting busy at that time. The night shift undermanager may have come out of the mine after inspection. He may be writing his report. Day shift people were starting to arrive at the mine for a 6.15 start. I used to look at the undermanager's report in respect of the afternoon shift to find out what had happened since I had left the previous day, are there any training items, are there any safety matters that I need to get involved with, just look at the Maihak screen, what's happening there, take the opportunity of meeting day shift people coming on shift and chatting to them about their progress with their training.

For example, I might have found - when I arrive at the mine, looking at my pin board where there is a number of log book entries from trainees that's been pinned up for me to collect every morning, I may have seen one that said, "This man is now ready for testing.", so it could be that I went and saw that man before he went underground and said, "How do you feel if we arrange it for tomorrow?", or words to that effect. So, I took the opportunity of meeting people to discuss those sort of matters as they came on shift. I also took the opportunity of sort of standing back in the undermanagers' office and listening to the day shift deputies coming and discussing - not just deputies, but some miners regularly came into the office, some occasionally, checking with the undermanagers as to the status of the mine; where are we going to be today? What sequence are we in? What did afternoon shift do? What have night shift done? These were sort of operational matters and I used to sort of sit back or stand back, and unless it involved me directly, I just kept a low profile in that sense, but I did gain quite a lot of information, and then the same happened at about 7 - 6.35 when the night shift came out and the same sort of communications took place - deputies brought their reports in, discussed with the night shift undermanager or the day shift undermanager as to events that were happening, and I sort of found that as an ideal communication avenue.

Now, at that time of the morning you mentioned looking at the Miahak screen, was that for any particular purpose each day or was that just part of your routine?-- That seemed to be as natural as sitting in a car and putting the seatbelt on. It just was part of the things that one did every day.

You mentioned that your training had been from the UK and all, to concentrate on the Graham's Ratio; would you actually do that on a daily basis?-- Yeah, I think so, but more so if I knew that we were in an extraction section, but, yes, it was a cursory - generally if we weren't on extraction it would just be a cursory look down the CH4 line and just take a general note as to the CH4 levels in various sections. If we were in extraction I would then start and sort of be more tuned in to CO and the Graham's Ratio.

Now, in relation to the 512 Panel, if I can just jump you ahead while we are talking about Graham's Ratio, you answered Mr Clair at one stage when he was saying to you, "Did you have any" - I will just try and pick up the question - pages 2,914 to 2,915. He was asking you effectively about the 8 ppm and the increase and whether you had any concerns, and you answered him top of page 2,915 by saying that amongst other things you had noted that the Graham's Ratio was still stable, there talking about in the period following the 22nd?-- Yes.

Still stable, and it had been stable throughout the days, and the transcript has you saying "at something like .8" per cent; is that right?-- No, if I said that that was an error. I should have said .08.

.08. We are not going to apportion blame, but it's in the transcript and I don't know how it got there. Can I jump you forward to specifically 512, and you mentioned to Mr Clair that there was an occasion when he was asking you some questions about whether you had observed anything particularly about 512. You mentioned an occasion in June, a Saturday where there had been some roof falls in 512 while you were down there with Steve Bryon; do you recall that?-- I do, yes.

That Saturday - I don't know we need debate it - was 18 June, and can you tell us what occurred there? Why were you down in 512 with Steve Bryon? Was there some particular reason?-- No, an undermanager's duties are various, but include making inspections underground where people regularly travel or work and on that particular day, as part of my duties, I arrived in 512 at around 12 noon.

There was no particular reason, it was just part of routine inspections?-- Part of my routine inspection.

While you were there was there some falls which created a windblast of sorts?-- Yes, I travelled down the top supply road, that is No 2 heading in 512, and met Steve Bryon at an intersection of a cross-cut that I cannot recall, but it may be approximately 5 cut-through.

Was it somewhere near where the face was or -----?-- No, the miner was working one pillar downhill in that cut-through. In

other words, the miner was working in and around 3 heading, what may be 5 cut-through. They were punching the outbye rib. In other words, the hanging rib.

Can the witness see Exhibit 77, please? Is that the report that was prepared by you covering this inspection?-- Yes, this is my report for Saturday day shift, and I cannot - it's a poor photocopy I cannot see whether it is the 16th or 18/6.

It's the 18th?-- Thank you.

Could you have a look at this document too? We will just identify more precisely where people were working at that time. Now, the sequence plan has been tendered and you will see that the day before they were working in the area that I've marked for you, afternoon shift on the 17th?-- Yes.

And so the next day they would have been in the same general area. I don't think you will find the 18th -----?-- Where you have marked is the afternoon shift of 17/6.

Tell me where that is by reference to cross-cut -----?-- That is in 7 cross-cut, approximately 5 heading.

Okay. So the next day they would be somewhere in that vicinity?-- So the next day - having seen this now I correct what I said, it could have been 5 cut-through. It's obvious from this plan that it was 7 cut-through and I was stood talking to Steve Bryon at the intersection of 7 cut-through, 2 heading and the miner was mining 3 heading, 7 cut-through.

All right, if you could hand that document back now and you can keep Exhibit 77 with you if you wish. On the occasion when you were talking to him at that point did he raise with you any abnormal aspect of 512 such as heat, haze, smell, ventilation, anything like that?-- There was no conversation in that respect whatsoever.

Did you observe anything of that sort?-- No, I did not. The miner was mining away. We were approximately one cut-through away from the miner so we were able to speak with ease without being overpowered by the sound of the machinery and we certainly didn't discuss anything adverse.

After the fall did you and Mr Bryon repair some stoppings?-- While we were stood at that intersection talking generally there was a terrific windblast which knocked down stoppings, I believe, in headings 2 and 3. Those stoppings had been placed to enable the ventilation current to flow over the miner.

So the regular cutting sequence stoppings?-- That is correct. Those stoppings were disturbed and blown down to the extent that the air flow had been disturbed. We, with the assistance of the mining personnel, corrected that, rebuilt the stoppings, and then Steve Bryon and myself informed the crew that we are going to go into the return and see if we can identify what damage if any has occurred down that roadway.

Now, at the time you and Bryon were fixing up the stoppings

which would have been around 7 cross-cut 2 heading?-- Yes.

Any observation of anything abnormal at that time?-- No.

Anything said by Bryon to indicate that he observed anything abnormal?-- No.

Did you go into the return?-- Yes, we travelled back outbye from where we were speaking which obviously is 7 cut-through back to 3 cut-through where there was a door into No 1 heading which is the top return of 512. We went through that door and made our way slowly down the top return.

Did you make observations at any particular stoppings on the way down?-- We stopped and examined every stopping all the way down.

Some had doors or holes in them?-- Some stoppings had cracks, some had holes which I put to pressure from either the roof, floor or sides, and as we passed each of these stoppings we did what we could in a temporary fashion to stop the air escaping out of the goaf into that roadway, and I'm speaking specifically in the roadways, and I can't remember which - cross-cuts 7, 8, 9, 10.

Did you go all the way down to 13?-- We went right to the bottom to - to the bottom of the No 1 heading which is 13 cross-cut and then we travelled 13 cross-cut right to its very extreme, right to its very end.

Now, at 12 cross-cut, on the way down was there a stopping that was open there?-- Yes, there was.

What did you do there?-- That stopping had deliberately been opened such that it had - it was a brattice stopping and it had a hole that had obviously been cut inside to allow air to flow out of the goaf at that point.

Was air flowing out of the goaf?-- Air was flowing out of that point.

If I can pause again and ask that question, anything abnormal observed by you or by any signature that Steve Bryon gave, anything abnormal observed by him?-- No, the only thing that we observed that was abnormal as we travelled down that No 1 heading was a strong smell of chemical - of roof bolt chemical smell.

You are familiar with that smell other than on this occasion, I take it?-- Roof bolt chemicals have a very distinctive smell. You can develop - or be aware of the smell during handling the boxes of - even the box smells. You can smell it during handling the material. You can smell it during its installation and you can certainly smell it, as I have in the past, you can smell it when it is ruptured during roof falls.

As you went across 13 cross-cut, any abnormal condition across there, smell?-- No, the roof bolt smell got less and virtually disappeared as we went along 13 cross-cut and the doors for

ventilation appeared to be normal. When I say the doors, I mean the openings in the stoppings appeared to be normal.

The air was coming out?-- The air was coming out as normal. We - Steve Bryon had with him a methanometer and we checked all the way down for methane.

Did you have any means for checking for CO?-- No, we did not have any means at that stage.

Now, on the Sunday, that's the following day, did you inspect 512 again?-- Yes, I did.

Could you tell me where you went and what you did?-- My recollections on that Sunday was that the amount of work to be done in 512 section was not excessive. There was very little work to be done in 512. The bulk of the work and subsequently the deployment of manpower was in the 5 South section of the mine on that Sunday.

You went into 512?-- I went into 512 as normal, yes.

And who was the deputy on shift?-- I believe Allan Morieson, if I remember correctly, was the deputy.

And did you go and speak to him?-- I'm sure I would have as being my normal mode of operation, but I cannot recall it.

George Mason was the undermanager-in-charge at that time?-- Yes.

Was he undermanager-in-charge and on duty on the Friday leading up to the weekend?-- I cannot remember.

Had he been told of, say, a tar smell, had that happened on the Friday immediately before you were going on duty for the weekend, in the normal course of events would you have expected to hear about it from him?-- I certainly would.

Had McCamley detected a tar smell on that Friday would you have expected to hear about it from him?-- I certainly would.

On the Sunday did you go down the top return and across the back of the panel?-- On the Sunday?

On the Sunday?-- No, I do not believe that -----

Your Worship, I'm about to pass to a separate topic; if you wish to stop I'm happy to stop, but I'm happy to keep going if you wish to keep going.

WARDEN: We can have 10 minutes now and that will give us a reasonable time to carry on.

THE COURT ADJOURNED AT 3.24 P.M.

THE COURT RESUMED AT 3.37 P.M.

JOSEPH BARRACLOUGH, CONTINUING:

MR MORRISON: Mr Barraclough, can I take you to a different topic now, please? At one stage Mr Bryon took over from Allan Morieson as ventilation officer for a short period of time?-- Yes.

Or at least, perhaps to be fair to Mr Bryon, took over part of the duties of ventilation officer?-- Yes.

Did you have some involvement in the hand over from one to the other?-- Yes, I did.

The day that Allan Morieson went off on holiday was 15 July, we know that. Did you have some discussions that day in relation to who would be taking over?-- Yes, I did.

Can you tell me about that, please?-- I cannot remember whether it was the Friday or whether it was some time before Friday, but I had spoken with George Mason in respect of, "Have you decided who is going to take over from Allan Morieson when he goes on leave?", and the response was, "Yes, I think we should get Mouse to do it.", Steve Bryon.

Did you have some involvement with Allan Morieson on the Friday when he left in relation to the hand over from Morieson to Steve Bryon?-- Yes, towards the end of the Friday day shift it was obvious Allan Morieson was getting a bit toey, a bit nervous. He was within half an hour of finishing his shift, or thereabouts, before some period of annual leave, and he did say to me, "What's happening with my replacement? What's going to happen? Who's taking over?", and I said, "Well, we need to make sure that we get Mouse to come and talk to you because Mouse is going to take over from you.", Steve Bryon. Then I found out that Steve Bryon was not available at that time. Whether that meant he was not on shift or he was - he had been on shift and gone early or what, I cannot recall. So, I was left in a situation where I needed to ensure that whatever was required from Allan Morieson's work with respect to stone dust samples or water barrier inspections or firefighting equipment, inspections, whatever Allan Morieson's schedule stated had to be done had to be passed on to Steve Bryon. So, I looked at the people who we had on site at the time and who would be available on the following Monday morning to be able to pass information on to Steve Bryon and I located Deputy Dick Stafford. This was at about 2.30. Dick Stafford would have started his afternoon shift at 2.15 that day, so I thought the best way out of this situation would be to see if Dick would be an intermediary, for Dick to go and talk to Allan Morieson to get the list of duties and work that had to be performed during the three weeks of his absence and then get that passed on to Steve Bryon. I went and had a word with Dick and asked him if he would be willing to do that and

he said, "Yeah, I've no problem, provided you are not going to ask me to do the ventilation officer's job because I don't want to do that job." I said, "No, that's not the point. All I want you to do, please, will you go and talk to Allan Morieson now and develop a list of things that need to be done and then pass that information on to Steve Bryon on Monday morning?" Dick Stafford had no problems with that and I took - I went along with Dick into Allan Morieson's office and I left the two of them discussing the schedule and the work to be done.

As far as you know, did that cross-over of information occur?-- I have no doubt that that did occur, yes.

Now, whilst talking about Allan Morieson who had the position of ventilation officer, can you tell me this: was there any time when he reported to you problems that he had or concerns that he had or worries that he had about the CO make?-- Steve Bryon?

Allan Morieson?-- I do not recollect him expressing any concerns with regards to CO make.

In relation to the 512 Panel specifically now, if I may, in terms of the ventilation in that panel, can you recall anyone raising with you problems with or concerns about ventilation problems in the panel?-- No, I had no knowledge of ventilation problems in 512.

Now, can I turn to a slightly different point, please? You mentioned to Mr Clair that you had embarked upon, at least in the early stages, the preparation of material for refresher training and spon com, that having been generated by the fact that the red book and blue book were no longer available or couldn't be obtained?-- Correct.

I think you indicated that you ascertained from the Mining Council, some lady from the Mining Council, it was out of print or unavailable or something?-- That is correct, yes.

Which was it, out of print or unavailable?-- Out of print.

Have you, since the incident, ascertained that that was in fact so, it's out of print?-- After the incident, reflecting on what had happened in connection with that attempt to obtain the books, I contacted John Sargaison who is, or was an officer at the Queensland Mining Council, and asked him did he have a copy of the fax that I sent down to the Queensland Mining Council requesting if copies of the blue and red book were available. He indicated to me - he searched for the fax and he said that he believed it must have just gone into the wastepaper basket and disappeared, but he remembers the inquiry and he did say that at the time of the inquiry he spoke with Mr Brian Lyne, Chief Inspector, and I think John Sargaison said that it was Mr Brian Lyne who said it was out of print and no longer available.

Now, you in fact read those two books at the time of deciding how you were going to go about getting some material

together?-- That is right.

Did they have much to say about CO make?-- I don't believe either of those books mentioned anything in relation to CO make.

Now, can I bring you forward in time, please? We mentioned earlier on the occasion of Mr Walker's inspection with you on 27 July; do you recall that?-- I do, yes.

Could you just tell me in relation to 512 where you went with Mr Walker? Perhaps you could - if you could just turn the first map over, you might be able to use the latest technology and tell us by reference to cut-through and heading where it was you went?-- We obtained a lift in a vehicle on the surface -----

Can you just pause for a second? You are back down on the seat. Just let me make sure that we have got this right. You might need the document again. 22 July was a Friday, that's when you had the 8 parts?-- That is correct.

And you had - people went down and checked it out and we have heard about that, the 8 parts?-- Yes.

What we might call the scare?-- Yes.

That was on the Friday. The Monday was the 25th, wasn't it?-- Yes.

And this inspection was a couple of days after that?-- Yes.

We understand from - you heard Mr Kerr give evidence that he had had a conversation with the Chief Inspector on the Monday, the 25th, about that incident?-- Yes.

So, this inspection by the senior inspector was only a couple of days after that conversation with Mr Kerr and the Chief Inspector?-- Yes.

Now, Mr Walker came. Can you tell me where you went with him in the 512 Panel?-- We walked down the bottom supply road. The reason I decided to go down that road is because I knew full well that we were mining in this particular area here in the bottom return at about 2 cut-through.

Now, the bottom supply road you are referring to is the No 4 heading as you enter the 512 Panel?-- That is that road there. We walked down 510 supply road, on the 510 - no, not on the 510 conveyor because the 510 conveyor ended there. We walked along the bottom supply road and made our way down to that point there in the bottom return.

Bottom return 2 cross-cut?-- 2 cross-cut. I cannot remember whether we went that way down 1 cut-through or whether we went down 2 cut-through, but we were there and that's where the miner was punching into that solid coal there.

What did you do when you got there?-- There was a discussion

between Mr Walker, myself and the mining operators, continuous miner operator and the cable handler.

Who was the deputy on shift that day?-- The deputy was Mr Reece Robertson.

Reece Robertson was?-- Yes.

Did he talk to the senior inspector?-- Yes, but that was later in the visit. At the time that we were at that point there Reece Robertson was not at that point.

And you talked to the operators of the miner?-- We talked to the operators of the miner and I tended to sort of take a back seat and allow Mr Walker to raise whatever subject he wished with the people involved.

And what was the topic?-- One of the topics was the fact that before we left the surface to go underground I received a phone call to say that there had been a roof fall in that bottom return, and I do believe the roof fall would have been at the intersection of the bottom return and No 3 heading - and No 3 cross-cut. When we arrived at that point - 2 cross-cut - the bottom return - we were able to see with our cap lamps the fall at that point.

Was the topic of discussion that you overheard centred mainly around the fall and the effects of it?-- Yeah, I think it was a case of how much warning did it give you, was there any chance of anybody being in danger. I do believe that some of the conversation may have been in respect of rampings and how steep do we go and that sort of thing, but-----

In that number - in the bottom return where you were standing, bottoms had been taken, hadn't they?-- Where we were standing, bottoms had not been taken.

Further inbye on the bottom return?-- That is correct.

And could you see those areas where bottoms had been taken?-- Yes, we could.

That was by the method of ramping?-- Yes.

It would have been perfectly obvious to the senior inspector?-- I would believe it was obvious to the senior inspector, yes. It was obvious to me.

Did you at some point leave the operators and then move back through the panel?-- Having spent, oh, probably 20 minutes on discussions there, we made our way up the cross-cut.

That's No 2 cross-cut?-- No 2 cross-cut. I think we made an inspection - a visual cap lamp inspection behind stoppings, probably there and there.

You are talking about roadways 4 and 3?-- 3 and 4, yes. Yes, that was just a normal sort of thing you do when you go underground on a visit - just lift up the brattice, have a look, shine your light in, what's the roof looking like, has there been any falls, what's the extent of stone dusting, what's the grade of the ramps and that sort of thing.

As you lifted the brattice and looked in, could you see the ramping?-- Yes.

And you were looking - actually at that point you were looking into the goaf?-- Yes.

Now, on each occasion when you looked in through the brattice there, was there any unusual feature that struck you about what you were seeing or smelling or experiencing?-- No, I didn't see or smell or hear anything that would have appeared abnormal.

So far as you knew, as you came back up the No 2 roadway, was the senior inspector looking in with you through those brattices?-- I cannot recall. He may have done. He may not have done. I just cannot recall.

Where did you go to then?-- We then continued walking up the conveyor road and up the 2 cross-cut until we reached the No 2 road, which is this inbye road, and made our way out to a point there, which is 2 heading between 0 cross-cut and 1 cross-cut.

And why did you stop there?-- That is where the crib table and first-aid equipment and all the host of equipment was located.

Is that where you met Mr Robertson?-- That's where we met Reece Robertson.

Did you have some discussion with him?-- There was a general discussion, I think, and I think one or two topics were raised, and I can't remember all the topics, but I do remember that there was quite a bit of discussion between Mr Walker and Reece Robertson in connection with Moura's record in terms of cable flashes.

Was there any discussion about ramping with Mr Robertson?-- Not that I can recall, no.

Did Mr Robertson mention anything about smells to you or to Mr Walker?-- He certainly didn't mention it in my presence. I never heard that, no.

And after a period of time there, did you move out and go to other sections of the mine?-- That is correct.

And then to the surface?-- Yes, we went to 5 South, and then we went to the 1 North-west section from which I organised a vehicle to take us to the surface.

Now, eventually Mr Walker left, but in the period of time between when you were down there - sorry, including when you were down in the panel and afterwards until he left, was there any adverse comment made by him about the panel, state of the panel, method of mining or anything else?-- No, not that I can recall.

Can I just take you to another topic for a moment, and that is to say the question of whether there was some emergency procedures that had been put in place that you were involved in. Now, there was a written document dealing with emergency procedures; is that right?-- That is correct.

And was that a document that had been updated from an earlier version, but updated in 1993?-- Yes, the emergency procedure document was updated in 1993, around about September, superseding a document dated 1990.

And had you been asked by Mr Abrahamse to do some work on updating the procedure?-- I was attending a safety conference with Mr Albert Schaus and possibly others in Yeppoon early in September, I believe, when I received a message from Mr Abrahamse saying that he was in the process of updating the emergency procedure and he asked me if I could assist in any way and whether I could locate documents for him by telephone.

And you did some work in relation to that?-- I did some work on the telephone in relation to that and I also did some notes and faxed them from the convention centre to Mr Abrahamse.

And later on did you and Mr Abrahamse and Mr Kerr do some work on amending the emergency procedure?-- I cannot recall Mr Kerr being involved with that updating.

Could the witness see Exhibit 121, please? Is that an office copy of the emergency procedure for 1993?-- Yes, there were a number of documents produced and this one obviously states it is the undermanagers' office copy.

Were the copies of the emergency procedure distributed or posted in various places, and if that's so, where?-- I cannot remember where. We had copies in the - George Mason's office, one in the undermanagers' office, I believe we had them in the engineers' office, we had one in the lamp room, which is recognised by everyone as being the communications centre - certainly the emergency communications centre.

Can you just turn through that document, please to a point where - I think it is page 11 - there are some flow charts depicted - pages 11, 12, and 13?-- Yes.

Now, those flow charts there, was something done in relation to those in terms of their size and distribution around the mine?-- Yes, when Jacques contacted me whilst I was at the safety conference I did make the point to Jacques that we had to be careful because we didn't want a document of 30 or 40 pages long that people had to read to activate some emergency situation. On my return to Moura, I developed three flow charts which-----

Are they the ones shown here?-- Those are the ones that you have referred to. The intention was that these three flow charts would summarise in easily read form the procedure.

And did you have these blown up?-- These were-----

That is bad terminology, I'm sorry?-- These were expanded to A3 size. This particular size is A4. They were expanded - blown up to A3 and laminated.

And were they then distributed around various places in the mine?-- They were posted on notice boards in workshops, the surface assembly area, George Mason's office, and the undermanagers' office and the lamp room, and the ones that related to the underground response, they were sent down to the crib rooms.

In addition to performing that physical task - that is, distributing the flow charts so that people would know what to do in an emergency - was there some activity that you caused to take place in relation to emergency phones on the surface?-- Yes, at this time the - I wasn't happy with the layout or the physical state of the lamp room, the lamp room being the point where the emergency phone was located. The phone was located on a point at sort of nose height and it would have been difficult for anyone receiving a call on that phone to make notes on paper because of the poor layout. At the time that we updated this emergency procedure, I arranged for the emergency telephone to be taken from that difficult

height situation and placed into a corner of the lamp room on to a bench - sorry, it was located on the wall immediately above a bench of about this height. On that wall we - I also located the flow charts, and I also established on the wall a plastic envelope with tick sheets, which were carbon copied.

And each sheet had its carbon-----?-- Each sheet had its carbon copy and there were specific questions written on the sheet. The concept was that when an emergency call was received, all the person receiving the call had to do was ask specific questions; for example: "Where are you? What has happened? How many people involved? What assistance do you require? Don't hang the phone up until advised to do so.", and things like that. So, those things were located in one corner, which came to be known as the emergency corner, and I had the telephone painted red so that it was clear to everybody that that was the phone not to be used under normal circumstances.

Did it have a dedicated number of 99?-- Yes, the system for emergency at the mine was that 99 was the number that people had to ring from underground if they found themselves in an emergency situation.

And 99 would get you the red phone and no other?-- 99 would ring the red phone and no other, and it would also sound a hooter that would continue to ring until the phone was answered.

Now, you can put that document to one side, if you like, but keep it with you for the moment. Now, in your time at Moura No 2 were there any emergency procedure simulations carried out in the nature of those exercises you have told us occurred at Collinsville?-- I was not aware of any procedure that had been carried out, but I have heard, and it may be in this Inquiry - I'm not sure - but I have heard that Mark McCamley may have done something at some stage. I do not know any of that detail.

In any event, does the topic "Emergency Procedures" and some of the details that we have just been discussing form part of the induction course?-- Yes, that is correct.

And had you, in fact, taken some steps just shortly prior to this incident occurring to organise and conduct some emergency simulation procedures?-- As part of our many deliberations, the safety committee set as one of its action plans for the fiscal year ending May 1995 a commitment that we would conduct three simulated emergency exercises during that time-frame.

Can you recall when the committee determined that they would do that?-- I believe those discussions took place on the 2nd of August.

And can you recall the proposed dates for the exercises, or would you like to refresh your memory?-- I cannot recall the dates, but it was something like three weeks after that meeting.

Just have a look at this document and you might be able to refresh your memory, both as to the date the committee considered this, or the dates set or proposed for the exercises. What was the date of the committee meeting?-- The date of the committee meeting was 2 August 1994.

And the proposed dates for the exercises?-- The proposed date for the first exercise - and it took three parts - the dates were: Tuesday the 23rd on day shift - of August, Thursday, 25 August on the afternoon shift, and Tuesday, 30 August on the night shift.

And can you just tell the Inquiry - you have mentioned that there were three parts to one exercise?-- Correct.

In terms of the three parts, what was the first part going to be on 23 August - a simulation in what sort of form - what problem?-- Yeah, what it was going to be was a beltman injured at dip 2 conveyor and we wanted to test the response from the lamp room at crib time during - using the DAC system.

The DAC system is a communication system?-- The DAC system is a sort of loud speaker, tunnel system.

That format had already been determined by the committee?-- Yes, the exercise that was going to be done on the day shift of the 23rd.

And, what, was the second exercise on the 25th on afternoon shift?-- Yes, the exercise at that time was to be a shuttle car running over a face worker and we wanted to test the response from the lamp room using the telephone.

And the third one scheduled for 30 August on night shift?-- Yes, that exercise was to be a collision of vehicles at an intersection and we wanted to test the response from the workshop using the telephone.

Each of those three were centred on the response from the surface to an event underground?-- That is correct.

And was there some consideration given for a later stage on testing response underground?-- As I've said earlier, we planned to do three exercises during the year. We did discuss whether we shouldn't go the full hog and say, "Let's evacuate the mine straight away. Everybody use your self-rescuers.", and we considered that we may in actual fact create a situation such that people who may be not as fit as others might find themselves in difficulty doing such an exercise. So we developed the line of thought that we should - let's first of all develop - let's first of all test the responses to an emergency before we actually got to asking people to wear rescuers.

You can put that to one side. In fact you can hand that document back. In March 1994 did you embark on a series of refresher courses in relation to the W65 self-rescuer?-- Yes. When I realised, having made inquiries about what do I do about self-rescuer - spontaneous combustion training and I realised that I would have to write the material myself, I then considered, "Well, what do I do in the interim while I am getting that training material together?" By reference to Part 59 refresher requirements I identified that the self-rescuer was one which needed to be done, that is the W65 rescuer, and in fact the other rescuer that we had at the mine and that is what is called the 30/100 rescuer, and some time early in March or thereabouts I did commence the 30/100 rescuer training. In fact I did complete that part of the training and we did start training on the W65 rescuer.

Now, can I just take you to a different topic? Two things finally if I may. You were asked some questions by Mr Clair about whether there was training or a safety consideration given to the way in which the Maihak system was used. Can I ask you this: was there ever any time when any of the electrical supervisors suggested to you that there was any deficiency in the way in which it was used or the number of people who were trained on it and so forth?-- No.

Can I turn to one last thing? You were also asked some questions about the format and content of deputies' reports and you told Mr Clair about how there had been a previous report form which by a consultative process had been changed to a new form?-- Correct.

Are you able to make any comment about the extent of information in the No 2 deputy reports and the practice of the wording that is used in relation to what is done elsewhere, Collinsville, for instance, or elsewhere in the industry?-- I cannot think of anything that leads me to suggest that the Moura report is any different from the report that we had in Collinsville.

Either in terms of its general format or in terms of its informative content?-- Yes, I believe - I cannot think of anything that would suggest there is a difference in either format or content.

I have nothing further, Your Worship, thank you.

CROSS-EXAMINATION:

MR MACSPORRAN: Mr Barraclough, can I take you back to some of your background? You gained your qualification, I think, in 1958 in the UK; is that so?-- That is correct.

When did you gain your qualification here in Australia?-- 1979.

That was soon after you came here, was it?-- That is correct.

I think your evidence was that you couldn't recall, when you were being questioned about the form of the old exam, whether you had been asked questions about spontaneous combustion or not. You couldn't say whether there were questions as part of your oral exam that covered that topic or not?-- I cannot remember.

There may have been, there may not have been, you simply cannot recall?-- That is the case. I cannot recall. It's - '79 to '95, it's 14 years or 16 years or whatever.

There is certainly no record that you have kept or could keep to indicate the format of that oral examination?-- No.

The point is, I suppose, that since that time you've gained a lot of experience in Queensland mines, since '79?-- Yes.

And they have included Collinsville most particularly, and then latterly Moura?-- Yes.

You've told us already that both were gassy mines to your knowledge?-- They were both gassy. Each had different gas -----

Different properties, but they were both gassy mines?-- Yes.

I think you were aware of a spontaneous combustion propensity at Collinsville, you had seen stock piles burning, things like that?-- That is correct.

Now, you weren't aware of, you told us, 5 North in 1986 at Moura. You obviously weren't there then; is that so?-- That is correct.

And you hadn't heard anything about it since you commenced at Moura?-- I had heard nothing about that incident, no.

But in spite of that you were aware that Moura being gaseous was liable to spontaneous combustion?-- In line with probably all coal should be considered as being liable.

You are not saying, are you, that your - you didn't have the opportunity to update your knowledge of spontaneous combustion at any stage had you so desired?-- I had every opportunity, I suppose, to update my knowledge, yes.

You've mentioned, I think, the blue and red books which you had at some stage in your possession?-- Yes.

Those you didn't think mentioned CO make particularly?-- That is correct.

But did deal specifically with the topic of spontaneous combustion?-- Yes.

Did deal with the signs of it; is that so?-- Yes.

Such as smells, hazes?-- Yes.

Rising CO percentages?-- Rising -----

CO percentages?-- Parts per million?

Parts per million?-- Yes.

Furthermore, since those publications have been in your possession there were other publications, weren't there, available to you in relation to spontaneous combustion?-- I understand there was the Strang Mackenzie-Wood document, yes.

That was virtually a text book, wasn't it, on Mines Rescue matters and dealt with spontaneous combustion?-- I suppose it could be called a text book, yes.

You were aware of that being available to you had you wished to look at it at Moura No 2?-- Yes.

There was also, was there not, material from SIMTARS available to you had you wished to obtain it?-- I am not aware of any SIMTARS document that was available.

You weren't aware of any SIMTARS seminar materials that were on the site, the mine site?-- Post August 7 I have learned that there were a number of seminars and documents produced in the late 80s.

By SIMTARS?-- By SIMTARS - SIMTARS or whoever.

SIMTARS and others, and such documentation was, did you understand, available or would have been available to you at the No 2 Mine?-- It may have been available, but I did not know of its presence.

But do you now know it was available at the mine had you wished to avail yourself of it? Have you learned that since,

that there was a library of sorts at the mine containing, amongst other things, publications from SIMTARS?-- I do believe I can remember that in this inquiry, yes.

In any event none of that material - you didn't see any of that material?-- No.

And didn't seek to avail yourself of it?-- No.

I take it your position, especially as safety and training officer would not be to wait for the inspectorate to tell you a situation was unsafe before you acted; is that so?-- I would not wait for anybody to tell me. I would use my own experience to make such determinations.

And that was the way you would like to think at least that No 2 ran, that there was a pro-active program to address safety issues?-- Yes, but I always took the view that I am not an expert or a perfect person and anyone that offers any sort of comment I would take on board and consider.

Certainly. You were always open, I suppose, to take advise about what was perceived by others to be an unsafe situation and act on it?-- I would consider any comment that I became aware of.

And anything you yourself deemed to be unsafe you would, of course, act upon?-- That is correct.

Mr Walker, as you've told us, was most often the inspector who came to the No 2 to inspect the workings?-- Yes.

You had contact with him, particularly, I think, on 27 July which was during the period when you were acting manager?-- That is right. I accompanied Mr Walker underground on that day.

Now, your relationship with him was good? You had a good working relationship with him?-- I believe so, yes.

Even during the periods when you weren't acting manager you dealt with him from time to time on various matters?-- Certainly not an a frequent basis, but we did have telephone conversations from time to time and we had social words when he came to the mine to visit with Albert Schaus, yes.

Generally you got along quite well with him?-- Yeah, he's a Pommy, see.

Anyway, on 27 July he came to the mine to inspect all of the workings and you accompanied him as acting manager?-- Yes.

Your relationship with him was such that you felt able to freely discuss with him any issues you wanted to raise on that day?-- Yes.

Certainly had you perceived a safety issue to be then current you would have raised it with him?-- I certainly would.

Especially in your role, when you weren't acting manager, of safety and training officer?-- Yes.

That was part of your - to the forefront of your role at No 2, wasn't it?-- Yes.

Now, you had as acting manager been told about what's been referred to as the scare the previous Friday, 22 July; is that so?-- Yes.

And you had, as a result of that, put in place a different schedule of taking the readings, that is changing from what it was then to daily readings?-- Yes.

So you obviously considered the scare to be a significant matter at No 2?-- On the day of the 22nd I was given eight parts. Eight parts was inconsistent with the Maihak readings in parts per million. It was a two point jump or thereabouts from the previous week of six. That change was of concern to me.

And hence acting on that concern, amongst other things you issued a directive that the readings be taken daily from that point on, the CO readings?-- Yes, in addition to taking steps to try and ascertain whether the eight was confirmed or otherwise.

So you took the whole issue, obviously, seriously?-- A rise from six to eight had to be taken seriously.

Apparently you didn't mention any of those facts of the events of the 22nd to Mr Walker on the 27th?-- I do not recall doing that, no.

Can you tell us whether it's likely you did or not? You say you don't recall; is it something you would have ordinarily flagged to raise with the inspector on his visit or something you would have considered to be not significant enough?-- I probably did not mention it to him. On the Friday afternoon I had information to say that readings taken at that time showed 5.5 - or between five and six. Readings taken on the Saturday, Sunday, Monday, Tuesday, Wednesday prior to Mr Walker's visit we had a consistent eight - sorry, a consistent 6 ppm or thereabouts, and I take the view that the eight parts was an anomaly and I thought that I had taken enough steps to form that opinion.

So the eight parts you concluded was obviously - or you thought was wrong because you had checked and you had daily readings to indicate the level had returned to about six or thereabouts?-- I had no information after going through the exercise that anything could support eight parts being valid.

So in that frame of mind you probably wouldn't have mentioned to Walker anything about the incident of the 22nd?-- That is highly - I cannot remember it, but what you are suggesting is highly likely, yes.

You certainly don't appear to have told him that the readings

were being taken daily from the 22nd. He wasn't informed of that change in schedule?-- No, I cannot -----

It's true to say, is it not, on that day, the 27th, there were no matters of concern inside 512 discussed?-- I did not consider any matters were present or active at that time that was of concern - was sufficiently of concern for me to raise with Mr Walker.

As you've told us the relationship was such, if there had been anything you would have felt free to raise it with him in discussion?-- That's correct.

Because his conduct prior to this day had been to respond to any concerns raised by mine management?-- I believe that to be correct, yes.

And took a keen interest in the programs that you had running as a safety and training officer?-- Yes.

He often discussed the objectives of those with you and the outcomes that you sought to achieve?-- I formed the opinion that Mr Walker appreciated the work that was being done at Moura to bring about improvements.

He as an inspector had been himself pro-active in pushing in that direction, that is to encourage the management to go that way?-- Of course, yes.

One thing that was discussed on that 27th, I think you've told us, was the issue of cable flashes; is that so?-- That is correct.

And that was with, I think, in your presence between Mr Walker and Reece Robertson, the deputy underground?-- That is correct.

And you were aware at that stage that cable flashes were a

major concern at Moura No 2, weren't they?-- Certainly.

And had been a major concern for the Inspectorate in seeking to have that problem addressed?-- That is correct.

The Inspectorate had been dealing with management on the basis that something had to be done about the incidence or frequency of cable flashes at No 2?-- Yes.

And a program had been put in place to reduce the incidence of such flashes?-- Along with the Inspectorate, namely, Mr Alan McMasters, we had developed procedures striving to eliminate cable flashes, yes.

And that was specifically discussed on this inspection date, 27 July?-- The question of cable flashes was discussed between Mr Walker and Reece Robertson. I cannot recall any programs that were in place that were discussed at the same time.

So, again on the 27th you would agree that a reasonably thorough inspection was carried out by Walker in 512, given where the mining was taking place?-- I believe so. Certainly going for walkabouts in the goaf just wasn't on.

Wasn't advisable?-- I led - I decided the route that we would take because I knew where the miner was located, I knew where the report of the fall that had occurred before we left the surface, and I cannot recall Mr Walker saying, "I would like to see this.", or, "I would like to see that.", but I am sure if he had done, that would have been built into our journeys, yes.

Certainly, but the procedure normally was, unless there was something out of the ordinary - it normally was the case that the manager would take the inspector underground if he was available and give him a short tour, as it were?-- My style has always been during the sort of preliminaries to an inspector's visit over a cup of tea or coffee, having a chat, "Is there anything specific you would like to see while you are here today?", and I am sure I would have said that at the time because that was my style.

And, of course, anything he nominated he would be allowed to inspect?-- That's correct.

In the company of the manager and whoever else was deemed to be necessary?-- Correct.

Now, as you have told us, there were no matters that you thought of concern in 512 on that day, but you have also told us that you weren't aware of things that had been reported as having happened inside 512 prior to that date. I am referring to smells being reported -----?-- Yes.

----- twice in June '94?-- Yes.

You knew nothing of those, did you?-- I did not.

And as far as you could tell, Mr Walker wasn't made aware of those either, certainly not by yourself?-- He certainly wasn't made aware of them by me, no, because I myself didn't know.

You didn't know, so you couldn't tell him, and he didn't raise the issue with you as to what signs had been reported inside 512?-- No.

And realistically, the only way he would find out about that would be to be told by someone who knew?-- I suppose that's correct, yes.

Speaking realistically and practically?-- Yes.

The only other way perhaps would be for Mr Walker to sit down on his inspection date and go methodically through all of the statutory reports that record these things?-- That is correct, or for Mr Walker to dictate something himself while he was down there.

When you say "dictate", you mean to request -----?-- No, to detect any abnormality.

If he detected something himself, he would obviously know about it?-- Yes.

But if something had happened and he wasn't told, practically speaking the only way he would find out would be to sit down and go through all of the reports that were made by deputies and undermanagers and perhaps managers?-- Yes.

And that's quite unrealistic, isn't it, to expect that of an inspector visiting the mine approximately once per month, or do you see it as being appropriate for him to be required to read every report that's made by an official?-- No, I don't think that that is sort of reasonable. If there was any - I am sure if the inspector had any suspicion of the nature of things that you are referring to, he would have done whatever investigation or asked whatever questions he thought appropriate.

And again, the relationship between Mr Walker - I suppose, the Inspectorate generally - and Moura No 2 is there was a degree of trust; that was fairly apparent, wasn't it?-- I suppose that existed. I believe there was a common respect on all parties that Moura was doing what was practically possible to improve the safety situation, the safety record.

So that realistically, given the nature of the working relationship, it would be unlikely that Mr Walker would find out about these things unless he was told by some mine employee?-- That is correct.

And, of course, you, as the acting manager on that day, didn't yourself even know about the history of these things inside 512?-- That is correct.

And if you didn't know, it was pretty unlikely for the inspector visiting to find out, isn't it?-- That is correct.

Now, I want to take you back very quickly to the question of your training methods. You have told us, I think, with the induction of new employees the format was done along the lines of the Queensland Coal Owners Association manual?-- Yes.

And that's been tendered here, I think as an exhibit. I think it's Exhibit 39. Could the witness see that, please, Your Worship? You have identified that, I think, earlier today?-- Yes.

I don't want to spend a lot of time on it, but is it the case - and by all means look through it if you have to to confirm this - but the question of spontaneous combustion is dealt with in material contained within that manual?-- Yes.

But there doesn't appear to be mention as such of CO make, but there is mention of things like smells being a factor in detection and rising carbon monoxide parts per million; is that so?-- That is correct.

And that material contained in that Exhibit 39 was the sort of material handed out to inductees or trainees through the course of your program with them?-- Yes.

In terms of other employees at the mine, you had a responsibility under the General Rules for refresher training; is that so?-- Yes.

That's, I think, in Part 59 of the rules?-- Yes.

You quoted those. I think you have agreed that part of those rules requires refresher training in respect of sources of ignition, including spontaneous combustion?-- Correct.

And that was part of the Chief Inspector of Coal Mines approved scheme of training?-- Yes.

And you were aware of it, as you have told us, and intended to train personnel at the mine, or retrain them, I should say, in spontaneous combustion?-- Yes, that is correct.

When we talk about employees at the mine, who are we talking about, all employees?-- All employees.

Including deputies obviously?-- Yes.

Undermanagers?-- Yes.

So, your scheme of training would have covered that level of official, undermanagers and deputies -----?-- Yes.

----- in spontaneous combustion. That was your intention?-- Yes.

Now, that plan did not eventuate because of the need for you to - I think you said write the package yourself?-- Correct.

And the reason that was stalling was because of the fact of the blue and red books being out of print. That was the initial stalling feature?-- The absence of the blue and red book was not in itself the reason why the training on spontaneous combustion was not conducted. I never envisaged training being in the form of, "Here you are, fellas, here's a book, read it and you will be fully trained in spontaneous combustion." That isn't good standard training and teaching, and it's certainly not my standard of training and teaching. I wanted the possibility of being able to hand out those books, and possibly hand those out in addition to other things, after verbal presentations with the assistance of visual aids.

But you had read the books and presumably had a copy yourself at the mine?-- I had, yes.

I don't want to oversimplify this, but it would have been possible for you to photocopy some of that material?-- That is right.

Indeed, as we have said earlier, you had access to other material, other literature, that would have dealt with spontaneous combustion?-- That is correct.

And, in fact, in the case of Strang and Mackenzie-Wood's book, it would have been more up-to-date than, I think, the red or blue book; is that so?-- Yes.

Well, that material could have been accessed by you, couldn't it, to formulate this package that you were going to put together to retrain the officials at the mine in spontaneous combustion?-- That is so, yes.

Is it really the case that - and I think you have told us this - but the reason you didn't pursue it in reality was that you didn't consider spontaneous combustion a significant enough risk at No 2 to warrant the time at that stage?-- I did not have any indicators that said that spon com training must take place immediately. The question of spon com training was just one item of training that I had in my mind that had to be conducted over a period of time. I wasn't just there sort of thinking, "Oh, right, well, I don't have to worry about that now, I can sit back and rest." I was thinking about other things that I had in train, sort of scheduled throughout the year, "What do I do next in terms of training? What training will I do from time to time down the year?"

But it was significant enough a risk apparently to be part of the Chief Inspector's approved scheme of training, wasn't it?-- That is correct.

And required, under the legislation, to be a subject of retraining every five years?-- Yes.

And pursuant to that statutory responsibility, you were going to do it?-- I was going to do it, yes.

But because at No 2 you didn't perceive it to be a significant enough risk, you went on to other matters before dealing with it; is that so?-- It was my intention to write the spontaneous combustion training package during the time that I was then doing the substitute training which turned out to be the W65, and in fact I had started to make brief key notes as to things that needed to be addressed when I got down to writing the package. I had thoughts in train as to what we were going to do.

And I think the realisation that you were going to do something about spontaneous combustion initially was about March of last year; is that so?-- Approximately that time, yes.

And then you had the difficulty with the literature and you went on to train in the self-rescuer, but you made some notes of key points you wanted to address eventually in relation to spontaneous combustion?-- Yes.

Where did those notes originate from? Were they from some other source, literature-wise, or where?-- They were just out of my head.

Your general knowledge?-- Things that we needed to look at; you know, the signs, the symptoms, the Maihak, how it works, the alarm systems, Graham's Ratio. I was starting to put my thoughts into gear on which - I was trying to develop a skeleton which I would later put flesh onto, so - yes.

As I understand your evidence, your state of knowledge as at that time didn't include understanding or appreciating the significance of CO make in litres per minute?-- That is correct.

So, whatever program you were putting together would not have addressed that sign of spontaneous combustion, that is, a rising CO make?-- I cannot agree with that statement because at the time that I would have got to writing the material I would have had to research a number of things, and that probably would have become apparent to me at that time.

So, before you were training these staff members, you would have been retraining yourself in spontaneous combustion?-- I believe that's a fair comment, yes.

When you were appointed the safety and training undermanager in about early 1993, was it ever ascertained your state of knowledge of things such as spontaneous combustion?-- No.

Was there ever any inquiry conducted with you by management of your state of knowledge generally about things you were going to train others in?-- No, I think it was generally accepted that because of my years of experience, that there was some expertise within the man.

I am not being critical of you personally, you understand, Mr Barraclough, but in terms of spontaneous combustion matters, you have conceded your knowledge was clearly deficient; that's so - the time we are talking about - or don't you concede that?-- My knowledge was based on my experience and my experience was not in litres per minute. Please believe me. I wish I had learned in the late '80's and early '90's of the developing thinking.

Again, you see, I'm addressing the system. The system has you as a safety and training officer to re-train mine officials in spontaneous combustion when your knowledge of that subject is clearly deficient; you accept that?-- My knowledge is different - coming from a different viewpoint to other people.

Well, the mine-----?-- If I may say, I still maintain that the Graham's Ratio is a valid monitor of spontaneous combustion.

Now, the mine we are talking about - No 2 at Moura - had a continuous monitoring system - the Unor?-- Yes.

And a practice at No 2 was to calculate the CO make in litres per minute weekly, wasn't it?-- Yes.

Were you aware of that?-- Yes.

And yet I assume at no stage did you investigate the significance of a CO make in litres per minute; that is, to understand the significance of it - what it was measuring and what it meant?-- I think, as I said in answer to a question from Mr Clair, I believe if one assumes - and I don't want to stress the word "assume" - but if one takes the premise that the velocity remains stable, a graph of CO make would be no different from a graph of parts per million. I knew that we were generating each week more CO than what we had the previous week, because that's the nature of an extraction system.

Did you understand it was generating more CO litres per minute each week, or just more CO parts per million?-- I'm not sure that that is correct.

I'm simply asking, do you say-----?-- I'm not sure that is correct. I think if one draws a regression through all the

peaks and troughs, it will show some consistency.

An increase?-- Yes.

The system increasing - that's the CO make or the CO parts per million we are talking about?-- Both.

You see, isn't the very reason why the CO make is used in litres per minute the fact that velocity can vary in the underground situation?-- Yes, that is correct, but from my observations of the velocity readings, the variations were not significant.

Well, you now know that, do you? I mean, you wouldn't have been concerned to look at the velocity readings at the time, would you, because you were going by parts per million?-- Yeah, but one looks at the whole data. You know, on a Friday Cocky Morieson or Steve Bryon would say, "Here we are.", and one would look at the data.

Cocky Morieson was producing a CO make graph, wasn't he, every Friday?-- Yes.

Which depicted litres per minute in graphical form; is that so?-- Yes.

So, are you saying you took note of that - the fact of an increase in make in litres per minute week to week?-- I observed the gradual rise in the graph and its shape, yes.

In any event, your main tool, as you have put it, was still the Graham's Ratio?-- That is correct.

And that depends upon - critically depends on the concentration of measurement of oxygen, doesn't it, because the formula that was used uses the oxygen deficiency to arrive at the ratio figure?-- The Graham's Ratio, as I understand it, is that it acknowledges the quality of the air going into the goaf and then compares that with the quality of the air when it comes out of the goaf, and that is some indication of what is happening in the goaf in terms of carbon monoxide produced and oxygen depletion.

But were you aware of the actual formula used to calculate the ratio? I'm not asking you to give it to us now?-- I cannot remember the formula. I know that it is in textbooks and I can go and work it out. The question of nitrogen features very strongly in the formula.

And that, in turn, depends upon the level of oxygen to achieve the subtraction, doesn't it?-- Yes.

So, if the oxygen is wrong, you are going to have a Graham's Ratio that's wrong?-- I'm sorry, I don't understand what you mean by oxygen being wrong.

If it is reading, or analysed incorrectly - the figure you are given for the value of oxygen in the atmosphere is wrong, your Graham's Ratio calculation would be wrong; is that so? If

there is 19 per cent oxygen in the atmosphere that's being sampled and analysed and it reads on the analyser 20 or 18, the resultant Graham's Ratio calculation would be wrong; is that so?-- Would be wrong?

Yes?-- Yes, but it would equally be wrong, too, if the measurement or the analysis of carbon monoxide would be wrong.

Perhaps it is a question of degree, but any of those items in the formula, if they are out when you measure them, the result of the formula will be in error?-- Yes, that's right, but - I don't want to be awkward here, but can I say that even taking litres per minute, one can make a mistake in taking the Drager readings, one can make a mistake in taking the anemometer readings, so taking those things as being in all cases - nothing is perfect.

Your whole system might be telling you the wrong thing. If you had those sort of errors, you just wouldn't know what was going on potentially, would you?-- That's right.

I suppose on that point, one way you could avoid the error factor of the Drager tube would be to rely upon the Unor readings, or combination of Unor readings for a shift or a day - they may have errors?-- That is correct, they may have errors, too.

But another measurement you can use if you wish to as opposed to the Drager - you can use the Unor readings?-- Yes, but as you have just said, the Unor could be in error, and I took that into account when I asked for daily readings to be taken, because I wanted to add that comparison established between one and the other.

In any event, the system you put in place and the daily readings taken was itself changed, apparently, by the undermanager in charge, George Mason, some days later?-- Correct.

Probably only a few days later. You put the scheme into effect on the Friday?-- I asked for it to be put into effect on the Friday and on my return to work after the weekend on the Monday, I found that the system was already in place.

And then do you know when it was - timing-wise - that Mr Mason changed the system again to include readings by shift, coupled with velocity readings by the deputies?-- Certainly that's what I'm referring to.

Same week?-- I asked on Friday for daily readings to be taken. When I returned to work on Monday, I learned that Mr Mason had instituted shift readings before my return to work. When he did it - I don't know if he did it Monday - Friday, Saturday or Sunday, I don't know.

You have conceded, I think, Mr Mason was doing that, apparently, to enable the CO make calculation to be carried out. I think you told us that before lunch?-- I learnt that on the Monday, yes.

On Monday, the 25th. Well, as I understand your evidence, you didn't raise with Mr Mason, and nor did he with you, the reason why he would change your system; is that so? There was no discussion between the two of you about what you had put in place and why he would change it if he knew about your system?-- I think I may have congratulated Mr Mason saying, "Good on you. You have gone a step further than I wanted it. You wanted it shift by shift. I wanted it daily."

He went further, as you understand it, to require the velocity readings as well?-- Yes.

So, the velocity and Drager readings, you understood, were to calculate the CO make as opposed to the parts per million to assess those?-- That is correct.

Did you ask him or did he tell you why he considered, as undermanager in charge, on Monday 25 July, it was necessary to calculate the CO make by shift or by day?-- I didn't ask him, no.

Did you see it as being a significant move for him to take to modify your procedure a matter of a couple of days after you put it in place?-- I wasn't led to question what he had done because the readings we got over the weekend of Friday the 22nd were no different from the readings that we had had in the week prior, and as the week developed, the readings didn't change either.

MR MORRISON: Your Worship, I am going to object to the line of questioning continuing at this stage - obviously it can continue as long as he likes, really, but until such time as we have checked the transcript just to confirm my memory, which was Mr Abrahamse's evidence was it was he who decided on the extra readings, not Mr Mason - there is no evidence before the Inquiry it was Mason who decided. It was, in fact, Mr Abrahamse who said it was he who was told to institute a system of daily readings, who drew up the graph and log in that form and he instituted the system over the weekend. I may be wrong, but I don't think so. If Mr MacSporran checks the transcript, it may be we can avoid this unnecessary line of questioning, which is, perhaps, on false premise.

MR MacSPORRAN: In reply, I understood this witness to say before lunch that Mr Mason, on his understanding, changed the system. That's the evidence this man gave, as I understand it, and that's the basis of the questions I'm asking, regardless of what Mr Abrahamse might have said about it. This witness has given an explanation for his understanding and that's what I'm basing my questions on. If I'm wrong about that, I can be corrected, I suppose.

WARDEN: Yes. How much longer did you intend to pursue this?

MR MacSPORRAN: I will be a little while yet, Your Worship.

WARDEN: I want to finish at 5 today.

MR MacSPORRAN: We can finish now and come back in the morning.

WARDEN: I will adjourn the Court and resume the Court at 9.15 in the morning.

THE COURT ADJOURNED AT 4.58 P.M. TILL 9.15 A.M. THE FOLLOWING DAY

WARDEN'S COURT

MR F W WINDRIDGE, Warden and Coroner
MR R J PARKIN, General Manager, Capricorn Coal Pty Ltd
MR P J NEILSON, District Secretary, United Mine Workers' Union
MR C ELLICOTT, Training and Development Officer, Department of Mineral Resources, New South Wales
PROF F F ROXBOROUGH, Professor of Mining Engineering, School of Mines, University of New South Wales

IN THE MATTER OF A CORONIAL INQUIRY IN CONJUNCTION WITH AN INQUIRY (PURSUANT TO SECTION 74 OF THE COAL MINING ACT 1925) INTO THE NATURE AND CAUSE OF AN ACCIDENT AT MOURA UNDERGROUND MINE NO 2 ON SUNDAY-MONDAY, 7-8 AUGUST 1994

GLADSTONE

..DATE 22/02/95

..DAY 30

THE COURT RESUMED AT 9.18 A.M.

JOSEPH BARRACLOUGH, CONTINUING:

MR MacSPORRAN: Mr Barraclough, when we concluded yesterday I had been in the process of asking you questions about your knowledge of the undermanager in charge, Mr Mason, changing the system of taking carbon monoxide readings inside 512. Do you recall those questions late yesterday?-- Do I recall them?

Yes?-- Yes, I do.

Can I just remind you of some evidence you gave when Mr Clair was examining you yesterday, and this is to do with your recollection of Mr Mason's directive? It is at page 2920 of the transcript. Question at about line 8 or so, Mr Clair said to you: "But from your side, not being a CO make man, if I can put it that way, what you were looking for was the parts per million?", and this is to do with how you were changing the system of taking readings. You replied, "That is correct. What I was trying to achieve in getting daily readings - and in actual fact George Mason went a step further than that and introduced a system whereby we got readings every shift - what I was wanting to establish was the relationship between the parts per million the deputies were receiving with the parts per million that the Maihak was giving." Remember saying that?-- I do.

Further down about line 22 or 23, you mentioned George Mason's direction. "George Mason gave a direction that deputies were to take readings, including wind velocity readings, every shift." You said, "That is correct." Question: "And obviously that was with a view to calculating the CO make. You said, "That is right." "You didn't really follow through to see that the system that George Mason had sought to establish was being carried out. You didn't do that because really you didn't see that as being significant; is that so?" You said, "As I said earlier, I didn't relate to CO make in terms of litres. I was aware that other people were thinking that way, but I had in my mind the image that assuming the ventilation velocity is stable, the shape of the graph of CO would be the same shape as parts per million. I do accept that the velocity does vary." Do you remember those answers?-- Yes, I do.

Question: "Did you know the terms of George Mason's direction?" You said, "Yes." "So, you knew that what he was seeking to achieve was a shift by shift reading?" "Yes." "With a view to calculating CO make?" "That is correct." "Did you leave it to him then to ensure that that direction was followed, or did you take some steps yourself to see whether that direction had been followed?" You said, "I did not take any steps." Do you remember saying that?-- At some stage in my evidence I did say that I did refer to deputies'

reports after the weekend to check that those readings were being recorded by the deputies.

You certainly said that later in your evidence and you confirmed, I think, from looking at those reports the following week, that the situation appeared to have stabilised and the readings were around 6 ppm, or something of that order?-- Well, when you say "stabilised", I formed the opinion and still have got the opinion that there was no deviation from that.

In any event, you agree from those extracts I have just referred you to when you were asked questions by Mr Clair that you acknowledged knowing of Mr Mason changing your system and that it was for the purpose, as you understood it, to calculate CO make in litres per minute - that is Mr Mason's system?-- Yes.

And to get back to what I was asking you yesterday afternoon, it is the case, isn't it, that with your knowledge of that, you didn't follow up with him - that is George Mason - nor did he with you, the reasons for his changing your system?-- No, I did not.

And you have told us you, having investigated the events of 22 July and looked at the readings on Drager tubes the following week, didn't consider that there had been a problem on the 22nd. You considered there was an error in reading, perhaps?-- That is correct.

That might be one reason why you didn't follow the matter through any further?-- I believe I have said in evidence the reason I wanted parts per million taken daily was so that I could compare those readings with the Maihak readings, because I had no guarantee that the Maihak readings themselves were correct, so I needed to have some assurance that we knew what we had down there, and 6 parts from the Drager comparing 6 parts with the Maihak gave me some confidence in knowing that I knew what was happening. The deviation I was referring to when - I think when I first mentioned the deviation was the fact that I had asked for it to be done daily, and George Mason went further than that and chose to make it every shift.

And as we have confirmed, you understood he wanted every shift to record the Drager readings of parts per million?-- Yes.

And in addition, the velocity reading for the purpose of calculating CO make?-- That is correct.

Now, looking back on it, do you see now that there may have been reason to ask George Mason why he considered it necessary to increase the vigilance of the monitoring system?-- No, I believe I thought at the time that I will be getting the CO readings at the end of the week on the Friday readings anyway, and, please, I was also cognisant of what was happening with the Graham's Ratio.

But it is fairly obvious, isn't it, looking at what George Mason decided to do, that he must have seen some significance

in the events of the 22nd to put in place a further closer monitoring of the CO make in the following week?-- Had the deputies been reporting somewhat different from 6, and let's assume 7's and 8's, I would probably then have had to rethink where my position was, but we had this stable situation.

In any event, that following week you were still the acting manager at No 2?-- That is correct.

And George Mason was the undermanager in charge?-- Yes.

And you didn't ever communicate with him, nor did he with you, about any concerns or monitoring of the CO make that week?-- I do not recollect any of those discussions or concerns.

Could I turn, then, back to the training you were carrying out and proposals you had. I think you have identified Exhibit 40, if I have got the note correct, as being an extract of the spread sheet you had produced of records of personnel at the mine and the status of their training?-- Correct.

Could the witness see that exhibit, Your Worship?

That's an extract, as I understand, prepared specifically in relation to the persons who were nominated to be witnesses in this Inquiry?-- That is correct.

And there is a larger document, being the total spread sheet, that refers to all of the employees at No 2 at the time of the Inquiry?-- That is correct. This is an extract of the larger document.

And a spread sheet was used to schedule, amongst other things, refresher training pursuant to requirements of Part 59 of the Act - the rules?-- The spread sheet wasn't used as a schedule as such, it was used to be a flag to me as to what was still required - what was still required to be done, yeah.

So, if you look at the schedule or spread sheet and say, "X, Y and Z are due for refresher training in topics A, B and C.", and put that in place-----?-- Yes.

-----are you able to say by looking at your extract there, which, if any, of the persons named on that sheet had had refresher training in spontaneous combustion? I should say, I understand that you didn't conduct any and you have given your reasons why, but does the spread sheet say which, if any, had had training in those parts?-- Would you allow me a moment?

WARDEN: Excuse me, are you marking that? Is that an original exhibit?

WITNESS: Could I speak to the paper?

MR MacSPORRAN: Yes?-- Looking down the sheet I find that we have Peter Coleman.

Was he a miner?-- He was a miner.

And is there a date as to when he was refresher trained in spontaneous combustion?-- We have a date for Peter Coleman as 16 June, to which I would like to return, if I may, later?

Is that 1994, is it?-- Sorry?

1994?-- That's 1994. J Taylor, where I have a date for the same date again, 15 or 16 June 1994.

J Taylor, is he a miner?-- He was a fitter - mechanical fitter. Those two persons, I remember instructing them in spontaneous combustion within the last two years. Peter Coleman possibly in - probably early '93, and J Taylor in 1994. They received instruction in spontaneous combustion as part of their basic induction program.

So, that was induction training?-- And at that time, those dates would have been inserted into this spread sheet. The dates we see now would refer to training with regards to cable flashes, the dates of which would supersede the original date, or override the original date.

Just so I follow what you are doing, you are looking at the column in respect of those two parties which is second from the - beg your pardon, fourth from the right-hand side of the spread sheet?-- That is correct.

Which is the column headed "Spontaneous combustion - gases, dust" and gives a module number or perhaps a number related to an improved scheme of training?-- If I can try and help there, the number is 7.2.1.10 and then a full description of that reference number is given towards the top of the page, right at the top of the page. The words "spon com gases and dust" is an abbreviation of the full title of that subject.

The full title is "Potential hazards of spontaneous combustion - mine gases, dust and other ignition sources."?-- Correct.

That's the sort of format you outlined to us yesterday as requiring attention?-- Yes.

And was covered?-- Yes.

The dates are given in that column in respect of Coleman, as you say, 16 June 1994, and do I understand you to say that that wasn't the actual date the training was given, it was given earlier?-- He received his induction - and I can't remember the date - in '93 or maybe - '93 I believe it was, some time in '93.

So the date on the spread sheet of June '94 what does that refer to?-- At the time that Peter Coleman had his induction, the date that he received the induction regarding spon com would have appeared - that date would have appeared on the spread sheet. Any later training in relation to subjects covered by reference number 7.2.1.10, any later training, the date then would supersede or overwrite the date that was there at that time and then as a back-track I could always search my records and find out the records relating to Peter Coleman's training, his dates and all that sort of thing.

I'm still a little confused about the date of 16 June '94?-- Yes.

On this spread sheet is that the date that he received subsequent training in spontaneous combustion after his induction training -----?-- No, no. We did no refresher training with regards to spon com. We have already established that.

This date of June '94?-- That would refer, I believe, to a mass meeting where we discussed in some detail the question of cable flashes, either a specific cable flash or the problem of cable flashes in general.

Are you able to tell either from this extract or from other documents in your possession when any of the personnel at the mine, including deputies and undermanagers, received training or refresher training in spontaneous combustion?-- I'm not able to say that, I don't know. I certainly did no training in -----

You told us that, we accept what you've said about that. When you came into the position in early 1993, that's the safety and training undermanager's position?-- Yes.

You would have looked at the records, as I think you've told us, to establish the status of each employee and the training they had received?-- Yes.

And then drew up a program for conducting refresher training and, of course, induction training for new trainees?-- Yes.

Can you remember then from those exercises whether any of the deputies or undermanagers at No 2 when you took over in early 1993 had received any refresher training in spontaneous combustion?-- I cannot remember. I do remember when I took over the post that there was a spread sheet with certain information on it. I did not delete or alter that program, that spread sheet, and I would believe that that spread sheet is still on my computer.

Of course, that's the spread sheet you worked from to compile your own spread sheet to update matters?-- That is correct.

Are you happy then to at some stage check your records to see whether that initial spread sheet is still in existence?-- I am happy to do that, but I do not have access to it here now, today.

I understand that, but at some stage when it's convenient are you happy to look at the information to see whether it still exists?-- I certainly am, yes.

Can I take you then to the question of - as you've told us, you didn't yourself personally consider spontaneous combustion to be a significant risk at No 2 and in particular at 512 Panel; is that so?-- That is correct.

But it's correct, is it not, that when the risk analysis in relation to the proposed method of extraction of panel 512 was carried out one of the hazards or risks identified was that of spontaneous combustion?-- That is correct.

I think you've indicated that whilst you can't remember being at the risk analysis process every day that it was conducted, you did attend from time to time whenever you could?-- That is correct, yes.

Could the witness see Exhibit 70, please, Your Worship? I think it's 70, the Minerisk document. Mr Barraclough, do you recognise that as being the end product of the risk analysis for 512?-- I accept it is the end product. There were a number of documents like this in the run up to the final document and I accept that this might be the final document.

Can I take you then just through it to this extent: it seems to be set out, or at least my copy is, so that in the top left-hand corner the initial analysis is done for sequences one, two, three and four which relate to the extraction of

barriers inside 512?-- Correct.

That seems to go for 21 pages of the document, can you confirm that for us, all relating to those sequences?-- That appears to be the case, yes.

Is the next series of sequences that is addressed, the next page in fact in the copy which deals with the phase of mining bottoms in the headings?-- That is correct, yes.

And deals with sequences five, 12, 19 and 26?-- Yes.

If you turn to page 3 of that analysis you see the first item on that page which deals with ramping into the bottoms in those sequences. The risk identified is "spon com from too much slack coal left. This could happen any time in panel."?-- That is correct.

It's given a probability of C?-- Yes.

What does that mean, a probability of C? Perhaps in conjunction with a risk score of 4?-- The paper that I am looking for which would assist me to answer your question I do not have in this exhibit, but I do believe I have it in my own personal -----

Do you wish to look at that quickly if you can?-- We are looking at - sorry, I've lost the page now.

It's page 3 in the second analysis of risks which is after page 21, the first series. Go to 21 then go three pages forward?-- Right. We are looking at a probability of C. The group decided that the probability - they gave it a ranking of C. The ranking - the system of ranking ranges from A, B, C, D and E. "A" being common or a repeating occurrence; "B" is known to occur or it has happened; "C" could occur or I've heard of it happening; "D" not likely to occur; "E", practically impossible.

So C is "could occur, have heard of it happening"?-- Yes.

Of course at No 2 it had happened apparently in 5 North in 1986, that is the heating, spon com had taken place?-- I understand so, yes.

How does that relate to a risk score of 4? Is that defined as well in the document you have?-- If we look at the consequence we have a ranking for people of 5 - I'm referring now to the Exhibit 70 - property of - a ranking of 5 and a production ranking of 1. If we do some sort of an averaging of that, and I'm not really sure how that is worked out by the ACIRL system or whatever, it comes to 4. If I can deal with people which is a ranking of 5, that's in a ranking of one through to five. Number one a fatality or permanent disability and five, no lost time injury, and if you wish I can go through two, three, four and five.

I think that's probably sufficient for the present purposes. It's rated for people and property and then the risk to

production and then the risk score overall is calculated somehow statistically on those averages?-- Yes, that is right.

Then there is the next column which talks about current controls to deal with the risk?-- Yes.

There are two of those nominated?-- Yes.

One is the panel life for 512 is short?-- Yes.

Secondly, continuous gas monitoring?-- That is correct.

Now, the life of the panel is nominated because, I suppose - somehow connected to this belief of the incubation period of Moura coal, is it?-- I do recollect that that was the sort of discussion that took place at the time.

There appears to have been a generally held belief that it was somewhere of the order of six months or so?-- Yes.

I think you quoted yesterday that the basis for that in your mind was the Kianga report which you had read at some stage either prior to coming to No 2 or whilst you were at No 2?-- The Kianga report that I had read did mention an incubation period of Moura coals of about six months, but I had previously had that sort of figure in mind from my education, I suppose.

Can I just show you this document quickly, if I might? It's a copy of the Kianga Inquiry report. Do you have that in front of you now?-- Yes.

Perhaps just to satisfy yourself for the record that it is a

copy, look at the front page of it. Does it purport to be a copy of the Kianga Inquiry report?-- Yes.

And the page that I have flagged for you is page 6. The page in front of you now is page 6?-- Yes, I am with you.

If you look at the left-hand column a bit over a halfway down, is there a paragraph dealing with the Inquiry's statement about the incubation period?-- Yes, I understand where you are, yes.

Could you just read that into the record for us?-- "It was predicted that the coal recoverable by this method would be totally extracted within six months. It was then planned to withdraw completely and erect permanent stoppings to seal this section permanently."

Does it go on to talk about the incubation period?-- "This action was to be taken because it was known that coal in the Moura district tended to spontaneously ignite after an assumed incubation period of six months."

Is that the part of the report you can now recall reading in relation to this matter?-- I believe that is the part that I related to, yes.

Do you see there now it's couched in terms of an assumed incubation period of six months?-- Yes.

Anyway, that part of the Kianga report seems to have been the basis for your belief that the Moura coal was in fact, or had in fact a six month incubation period?-- I had the belief that six months was a figure to be sort of borne in mind because a period of time is not the only factor involved in incubation. There are other factors involved. As I explained yesterday, coal type, method of ventilation, method of mining and other factors.

All of which have a part to play in the liability of the coal to heat?-- That's right, six months was a figure I had in my mind solely as a sort of a guide. You don't remember every word that you read, but I do remember the six months as an indicator.

Certainly. Your Worship, perhaps I should tender that report. I don't have copies at this stage, and I prefer to tender a clean copy of the report. I will undertake to do that later to produce it to the panel as a matter of housekeeping, but I probably should tender that report.

WARDEN: That report will become Exhibit 168.

ADMITTED AND MARKED "EXHIBIT 168"

MR MACSPORRAN: Mr Barraclough, then on that basis one of the controls obviously should be a consideration of the life of the panel, how long the process is going to take from start to finish?-- That is correct.

And that's nominated on the risk document?-- Yes.

The second control then currently proposed was continuous gas monitoring?-- Yes.

And, of course, that's clearly a very important control in relation to spontaneous combustion?-- Yes.

Because that's a way you can hopefully pick up reasonably early signs of spontaneous combustion?-- Yes.

And it was envisaged that the continuous gas monitoring would be an important part of control of such risk?-- Yes.

And as we now know, and you would have known at the time, such continuous gas monitoring at No 2 included proposed weekly calculations of CO make in litres per minute?-- I cannot remember the discussion relating to that respect. I do recollect that we were saying, "We've already got it in place anyway.", referring to the Maihak system.

And you now know perhaps, if not before, that during the course of the second workings weekly CO make was calculated?-- Yes.

Then we move to the possible controls on the sheet, and the control is to pump water into the old workings; is that so?-- Yes.

And the idea of that would be to extinguish any known heating?-- Yes.

By flushing or flooding them with water you would extinguish the heating. Would that be the proposal?-- I think your question is assuming that we would only use water at the time a heating was known. I think the general sort of thought at the time was, "Well, when we have worked a certain portion of the goaf, it may be possible to flood it.", irrespective of whether we -----

Had a heating?-- ----- had a heating or not. I think that was the sort of mood of the group at the time.

Do you recall some discussions along that line, that a possible scenario would be to guard against the prospect of spontaneous combustion by -----?-- I don't think - sorry?

By flooding parts of the goaf, or the goaf generally?-- I don't think the question of water took a great deal of time during its discussion. I think it probably may have been one person that said something like, "Oh, it is possible we could probably put water in the goaf anyway.", and I think it would have sort of cleared as that without any major discussion on it.

One of the difficulties, of course, is if you know you have a heating and you seal the panel, there is a substantial risk, isn't there, that you will have an explosion?-- Sorry, could you repeat that?

If you have a heating inside a panel and the action you take is to seal the panel, there is a substantial risk that you may have an explosion?-- Yes, if there is a known heating, a known heating in the panel, yes.

Because after you seal, the mixture goes through the explosive range at some stage before it becomes inert?-- Yes.

And if there is a heating inside, there is a prospect, a very real prospect, you will have an explosion, ignition?-- If there is a known heating within a sealed section, yes, there is a probability of an explosion, yes, assuming methane is in certain portions and -----

At the explosive range?-- Yes, that's right.

And indeed, I suppose, that's what in general seems to have happened at Kianga, the panel was sealed and it exploded in fact during the course of sealing?-- Yes.

Now, one other way to deal with a known heating inside a panel would be to inertise the area?-- That is correct.

Were you aware of any information that had been sent to No 2 in relation to procedures to inertise a mine or a panel?-- I was not aware of any information that had been sent to No 2 Mine, no.

Were you aware that after the No 4 incident at Moura the Inquiry into that incident recommended that a committee be established to look into ways of inertising a mine?-- No, I did not know that.

I take it you weren't then aware of any report from that committee being forwarded to the managers of mines, including No 2?-- I am aware that work, or research, has been done in relation to the inertisation of coal mine areas by nitrogen. I am aware of it. I don't know anything about the technique, how it's done, but I do know that it is possible to inertise areas of mines by introducing nitrogen.

Are you aware of any research that's been done into the process of inertising mines with the use of jet engines?-- I have heard of it, but -----

Again, just to complete it, as a safety and training undermanager at No 2, you didn't ever see any report of a committee that reported after the No 4 Inquiry?-- No.

Can I take you then back to - you can hand that exhibit back. Actually, for the record, I think you said a moment ago it was Exhibit 75. Is it document 75 in Exhibit 70? I think on the exhibit itself it should have a note?-- Yes, I have two

numbers here, 70 and 75.

So, it's document 75, Exhibit 70, just so the record correctly records that. You can hand that back. Could I then ask you to look at Exhibit 160? When you were acting manager at No 2 between 11 and 31 July last year, did you make entries in the manager's record book relating to your inspections?-- The mine record book?

Yes?-- Yes, I did.

Is that Exhibit 160 a series of extracts from the mine record book?-- Yes, it is.

In particular, if you turn to - I think it's page 24 is the first relevant point in that exhibit. Do you have 24?-- Yes.

And you see the notation - well, there are two notations for 512 Panel. The first one in the top half of the page?-- Yes.

Relating to 8 July 1994?-- Yes.

And that entry, one assumes, is completed by Mr Schaus?-- Yes.

It's signed by him?-- Yes, that is correct.

The next entry for 512 is in the bottom half of the page, and my copy is cut off at the bottom?-- Yes.

The date appears to be 15 July?-- Yes.

And there is a signature there which I can't read. Is that yours?-- That is correct, that is my signature, yes.

And is the entry that you have recorded for 512 in these terms: "Continuing rib punching. Mining sequence 13 today. Well defined gutter and joint pattern evident in roof. This was brought to the attention of all personnel. The extraction system appears to be complied with. A steady growth of CO being recorded in the top return, currently at 6 ppm.", and then "(14.9 lpm)"?-- Correct.

Can I ask you - firstly, that is your entry?-- That is my entry, yes.

And that was made on 15 July, was it?-- That is correct.

Can you recall now where you obtained the information relating to the steady growth of CO in the top return, currently at 6 ppm and then 14.9 lpm?-- That entry was made - that report was made after I had received the weekly survey from Allan Morieson, the ventilation officer.

So, do you think you took that information directly from his figures?-- I used the data that he gave me to register those figures, 6 ppm and 14.9 lpm.

Could the witness see - I think it's Exhibit 109, Your Worship? Now, the copy of this exhibit that I have refers to the CO make in 512 at the start of the panel's life in February '94 and then goes through a series of logs of data; is that so?-- Yes.

If you look at that sheet, the bottom of the first page relates to the date, 15 July?-- Correct.

And gives the CO readings from the parts per million, which is the Drager obviously, and the Maihak as being 5 and 5.7?-- Yes.

And the CO make calculation being 14.59?-- Correct.

Well, do you think there was some other document that you looked at to obtain the figures you put in your manager's report?-- I believe this Exhibit 109 is the document that I would have referred to to assist me to compile that report in the record book.

Well, you see, the information on that sheet, if that is the one, doesn't really match the information in the record book, does it?-- That is correct, and I - on this Exhibit 109 we have a litres per minute of 14.59. I have entered 14.9 in the record book. Until this moment that you have drawn my attention to it, I did not realise there was that discrepancy.

To be fair to you, there may be another document that you looked at and it may not be this exhibit, but this exhibit seems to be on the information that Mr Morieson may have compiled and certainly did compile, I think, after the event from records he held, but, anyway, it was Morieson's document you looked at to get the figures for your manager's report?-- If Allan Morieson has produced information after the event, that can not change my entry on 15/7 in the record book.

You see the 15th entry there at the bottom of the page has the readings in the top return as you have acknowledged of 5 and 5.7 and in the bottom return of 1 on the Maihak, which gives a total CO make figure of 14.59?-- Yes.

So, if you take out the bottom return, dealing with the top return, you have a lower figure than 14.59?-- Correct.

In any event, as at 15 July, your record book entry refers to a litres per minute make of almost 15?-- That is correct.

But, again, as you have given in evidence, the actual make figure did not have any particular significance to you?-- That is correct.

Although you recorded it because Morieson had?-- I'm a person that tends to record as much information I can for the record.

We go then to the next page of that compilation, Exhibit 160. You see there is apparently your entry on page 25 for the 22nd of July?-- That's correct.

And the entry for 512 panel reads this way: "Continuing rib stripping in the 3 to 4 cut-through area. Roof and rib conditions appear stable. Maihak CO readings remain stable at 6 ppm (14.9 lpm) with Drager reading rising to 8 ppm. Drager readings will be taken and reported daily."?-- Correct.

That again reflects your thinking at the time and the steps you put in place?-- Yes.

Again, to shorten this process, the information of 6 ppm on the Maihak and 14.9 lpm would have come from Morieson's compilation?-- Yes.

Well, if you look at that sheet, page 2 of that Exhibit, you see the entries for 22 July, and there are two of them?-- Yes.

One is including the 8 ppm reading you referred to, giving a total make of 18.98 lpm?-- 18.6 for the top return and-----

Point 36?-- Yes, for the bottom return, making a total of 18.9, 19 litres.

The p.m. reading or afternoon reading for the same dates: 5.5 and 5.7 ppm on the Drager and Unor?-- Yes.

And a total CO make of 13.7 lpm?-- Yes, correct.

Again, nowhere there is there the figure of that 14.9?-- That is correct.

But you think you looked at some document that Morieson had and then transcribed it into your manager's book entry, or mine book entry?-- I'm not aware of any other document. I cannot remember. I cannot recall any other document being presented to me and being discussed between Morieson and myself, other than this one.

That form. All right. The final entry I think of yours is on the same page, 29 July, in respect of 512?-- Correct.

"Stripping ribs and taking bottoms in the last row of pillars. CO on the Maihak remain at 6 ppm."?-- That is correct.

That was the last entry you made as acting manager before Mr Schaus came back the following week?-- Yes.

If you would hand those back, if you wouldn't mind? Now, I think you told us yesterday - and correct me if I am wrong - but you did speak to Mr Schaus when he came back and resumed his position as manager?-- Yes.

And you didn't yourself discuss with him, or did you, this arrangement or this investigation that had been carried out on 22 July, and your arrangement to have daily readings taken?-- I cannot recall specifically referring to that incident, no.

That would have been something, though, surely that you would have brought to the manager's attention when he came back, or should have brought to his attention?-- I brought to his attention a number of things that I considered that was important for him to know on the debriefing and my handover to him. The reality of the situation was that the parts per million when he went on holiday was in the region of 5 or 6 and was still in the region of 6 when he returned. As I've said earlier, I believe I satisfied myself - I know I satisfied myself that the 8 was an anomaly and the whole series of investigation had eliminated it as any credibility.

I suppose it would have been relevant to Mr Schaus, wouldn't it, to have known that there was - even if it was a rogue reading or reading in error - there had been a reading of 8 ppm on 22 July - relevant for him to know that in case there was another such reading to appear during the course of the time he resumed his duties at manager. It would be a relevant factor, wouldn't it, for him to know or take on board?-- During his term as manager, there are many things that occurred and many things that need to be investigated. Some you can confirm as requiring further investigation, some you can dispel as being anomalous, and as I have stated before, the 8 parts I firmly believe just didn't exist, and I obviously did not refer it to - I don't recall referring it to Mr Schaus, because we had other important things to discuss and that was not one of them.

So, you certainly don't recall referring him to that fact?-- No.

And from what you say, it is unlikely that you did?-- That is correct.

Now, finally, you have said yesterday, I think to Mr Clair, that the fact of a smell and haze being reported inside 512 would be something, had you known of it, that would have required a thorough investigation?-- Certainly, yes.

And the reasons for that are fairly obvious, because smell and haze are signs of a spontaneous combustion?-- I think I've said earlier in answer to a question from Mr Clair that I don't - I cannot conceive anything more serious and requiring investigation than smell, haze, or things of that nature. I cannot imagine anything being more important underground in a coal mine.

I think you mentioned possible ways that could be done - that is, the investigation of such signs, one of which was the use of an instrument called a probeye?-- Sorry, I did not refer to a probeye.

Sorry? Do you know of a probeye?-- No.

Never heard of an instrument called a probeye?-- I have not. Sorry, I did not know of a probeye before 7 August. I have certainly heard of it during this Inquiry.

You now know that it is a device that can be used to detect a heating inside an area?-- Correct.

And you now know that there was one available for use at No 2?-- I now know there was one available.

Available prior to 7 August?-- I did not know its availability prior to 7 August.

The other investigation that was available was to put bag samples through the gas chromatograph?-- Yes.

To show up possibly signs of heating?-- That is correct.

And another way, I suppose, was to seek assistance from experts in the field to interpret such signs and to carry out independent investigations?-- Had I been aware of those symptoms, those were actions - opportunities that could be taken, yes.

And one such body of experts you could have called upon quite readily were SIMTARS personnel?-- Yes, that is correct.

And as at 7 August, and prior to that date, you were certainly aware that SIMTARS were available for such assistance?-- I knew SIMTARS existed. I knew that they were connected to the gas chromatograph network via modem and I knew they were a service to the industry. I knew of their existence, yes.

Thank you, Your Worship.

CROSS-EXAMINATION:

MR MARTIN: Mr Barraclough, could you please tell us as quickly as you can what percentage of your time was tied up on committee meetings, or preparing for meetings?-- The answer has got to be very broad. I would need time to go away and think about it and do some calculations, but, oh, 25 per cent as a rough figure - 20, 25 per cent.

Would that apply generally to anybody you might broadly describe as management - that is, under-deputy upwards at the mine - or would some spend more than that time?-- If I can just use the mass safety meetings as an example, which we held at intervals between probably four and eight weeks. I prepared for the meeting. I attended - let me say the night shift meeting which took place maybe for three hours, I then attended the next morning day shift meeting for three hours, then I attended the afternoon shift meeting for three hours, and then I attended the odd off-shift - that's the 7 a.m. meeting the following day for three hours, and then I put together all the minutes, all the feedback from the meetings and produced the minutes. The undermanager on each particular shift himself would only devote that three hours to the meeting, in the sense that I would have devoted in excess of 12 hours to that particular set of meetings.

I understand?-- So, it doesn't mean that everybody spent the same amount of time at meetings that I did.

What about Mr Schaus?-- Sorry?

What about Mr Schaus?-- Mr Schaus on those particular meetings spent the same amount of time-----

But on other meetings on committees, is what I'm concerned with?-- I was on - as I have explained before, I was on the consultative safety meetings-----

I am asking about Mr Schaus?-- Mr Schaus attended the mass safety meetings like I did. Mr Schaus attended 7.30 a.m. meetings every day, which lasted approximately half an hour, where we reviewed what has happened in the last 24 hours and what is going to happen in the next 24 hours. Mr Schaus attended a Thursday afternoon meeting where we prepared - where the weekend work was discussed and prepared. Mr Schaus attended some MCC production meetings, MCC productivity meetings; he attended work model management committee meetings, which were held probably every six or eight weeks, and there may be other meetings that I can't recall.

All right. Perhaps I should ask him. You spoke yesterday about Train-the-Trainer and, I think, a course at Central Queensland University; do you recall that?-- That is correct.

Were there any examinations conducted into the proficiency or the learning of the people who did that course? Did they

pass? Did they understand what they learnt? Is there any examination?-- I don't recall any specific test paper or examination paper. I do recall during the course of the course, which lasted five days, that the facilitators - they mentally - or made notes of a person's performance when he was giving a demonstration, or giving a presentation, and the certificate that was finally issued after that stated "this person has successfully completed this course and met all its requirements".

A certificate was issued?-- There was a certificate issued, yes.

You were talking yesterday about - I think it was Part 59 of the, I think, general rules for underground coal mines. That came into effect on 1 September 1988?-- I believe that's correct.

And you have answered numerous questions about this - I don't want to labour it - but how were you, or anybody else for that matter, able to determine who required retraining within that five years? What basis? How was it organised to determine who, amongst the personnel, required retraining?-- That determination became evident by use of the spread sheet that I have referred to earlier.

Have I misunderstood your evidence? Is it the case that only two people got training on spontaneous combustion - two inductees - or were there more?-- No, in evidence I think I said that on that particular sheet at which we were looking at at the time - the exhibit number I have forgotten - which was a list of potential witnesses - within that list there were two people who had received induction training within the last 18 months.

And you have volunteered to go and obtain the spread sheet for us - the full spread sheet giving all of the information about all the staff?-- No, I have volunteered to go and see whether what is on the spread sheet existed at the time that I took office in January 1992.

All right. Well, what this Inquiry is interested in in this respect is what people - which people were, in fact, retrained within that requirement of the Act? Can you produce that from your information at the mine?-- The total sheet?

Mmm?-- Not the extracts, the total sheet?

Yes?-- Yes, I can.

Well, I would ask you to do so?-- Sorry?

I would ask you to do so and produce it at some convenient time. And in relation to such people as Mr Schaus and Mr Mason, were they to fall into this category of retraining - indeed, yourself - of spontaneous combustion?-- The generality of the Act in general says, "The manager shall ensure that all persons" - and "all persons" means all persons.

My learned friend, Mr MacSporran, I think, asked you yesterday why it was that you didn't cause to be photocopied the blue training book relating to spontaneous combustion; do you recall that?-- Yes.

Why wasn't it done? It is a simple matter, isn't it? It is not a big book?-- As I explained yesterday, if I was going to issue the blue book or the red book, that would only be part of the training. The training would be conducted in classroom sessions, probably with demonstrations of equipment and things, and it would have been easier - if I had intended issuing the blue book, it would have been easier for me to purchase it than what it would have been to get someone to photocopy it.

At least had it been produced, it would have been something of an interim step, wouldn't it?-- Yes, it would.

And I think you say that you were going to do some research, write some material ultimately, when you got the time to do it; is that right?-- Sorry?

You said that you were going to do some research and write some material in relation to spontaneous combustion?-- That is correct.

When, before August 1994, did you last look at any technical data or material relating to spontaneous combustion?-- Probably around about the time of April May 1994.

In what connection?-- With preparing and getting my thoughts together as to what training I should be doing, and my thoughts in that context were not limited to spontaneous combustion. I had other training activities that needed to be done also.

Well, at the moment we are interested in spontaneous combustion?-- Yes.

April/May 1994, what did you look at in relation to spontaneous combustion?-- I looked at the red and the blue book and I looked at the Strang Mackenzie-Wood document.

Well, which one did you look at? Was it the one with the glossy cover, or the blue one - big blue book?-- I cannot recall.

Where did you look at it?-- In my office.

Where did you obtain it from?-- I cannot recall.

Was it in your office all of the time?-- It was, yes.

And you didn't, prior to that time, ever pay any regard to it?-- I may have looked through it for some specific reference, but I cannot remember what that was now.

Well, you can't remember whether you did look through it at all before April or so 1994?-- I certainly know with confidence I did not read it from the first word right through to the last word, but I did look at it on occasions for specific purposes for which I cannot remember what they were. It may have been in connection with instruments. It may have been in connection with the Drager or the minder or something. I cannot remember.

All right. Well, you've told us about those instances. When since you received your qualifications, which I understood you to say was as far back as 1958?-- That is correct.

When did you attempt by any means, by scientific data or literature, to update your knowledge about spontaneous combustion?-- Academically I do not recall doing any reading in relation to spon com. I gained whatever experience I have practically, on the job.

From whom?-- From Collinsville.

From who?-- From experience in Collinsville.

I see, but how did you know what to look for in this modern day long after 1958?-- Graham's Ratio.

Is that what you learned back about 1958?-- That's what I learned in 1958 and I still believe it is valid now.

Collinsville had a number of heatings, didn't it - or fires more particularly, underground whilst you were there?-- I cannot recall any fires in Collinsville in my time.

Let's talk about heatings then as opposed to fires?-- I cannot recall any heatings in Collinsville during my time.

Well, do you know from your knowledge from being at Collinsville that prior to your time there were fires or heatings in Collinsville?-- I cannot recall receiving any of that knowledge and I find it hard to believe that Collinsville could have spontaneous heating.

Why?-- The seam gas in Collinsville is approximately 95 per cent carbon dioxide -----

You told us about this yesterday; is that your explanation now -----

MR MORRISON: Don't stop him, let him answer, you asked him -----

MR MARTIN: I am trying to shorten this proceeding. Answer?-- I'm trying to answer as best I can to facilitate the process of this inquiry.

Well, do so?-- The seam gas in Collinsville is pretty well 95 per cent carbon dioxide and three per cent methane which indicates that the primary gas is carbon dioxide. Carbon dioxide has a relative density of 1.5, that means that it settled to the floor of any workings which are not ventilated or which are poorly ventilated and readily displaces any other gas from that floor level.

So that's your explanation for that, but then you went to Moura which you knew to be a gassy seam, gassy with methane which is lighter than air?-- Correct. I knew that, yes.

And therefore you must have known that the incidence of spontaneous combustion at Moura was likely to be much more of a risk - or much higher than at Collinsville?-- Yes, I do not deny that I probably thought that, yes.

Yesterday I think you said in evidence - you gave evidence to this effect: that since this inquiry everyone's knowledge in relation to spontaneous combustion has improved; is that what you said?-- Yes, I did say that, yes.

What I'm suggesting to you is that immediately before and immediately after 7 August 1994 there wasn't one piece of scientific literature or instrumentation which wasn't available at No 2 in relation to spontaneous combustion. It was all there immediately before the explosion and in the months and years leading up to the explosion, wasn't it?-- From what I have heard in this inquiry there were various documents available prior to 7 August, yes.

And the state-of-the-art scientific equipment on analysis of gas. That's the case, isn't it? That was there as well?-- Gas chromatograph?

And the Unor?-- Miahak, yes - Unor/Miahak, yes.

Why as safety and training officer didn't you lay down a program in relation to the usage of gas chromatograph and/or Unor?-- As I've explained previously with regards to training, we did training largely on a perceived needs basis and I did not perceive the need to do it.

All right. Yet, you must acknowledge, I suggest, that the greatest potential for disaster in a mine is an explosion of some gas, some type of gas, methane in particular?-- I accept that, yes.

Where was the electronic noticeboard you spoke about yesterday?-- It was located in the general assembly area. The general assembly area is approximately six metres square. It is located immediately outside the lamp room, outside the bath house and it is adjacent to the window which clearly shows the Maihak monitoring system screen. The electronic noticeboard itself was located on the wall immediately below - immediately above the window that displayed the Maihak screen, immediately opposite a set of seats which people sat awaiting the transport to take them underground.

And easy enough to display such words as "Panel 512 sealed last night"?-- Yes, easy to display any message, any message whatsoever.

You've told Mr MacSporran about entries in the mine record book. You've told this inquiry that each day whilst you were acting manager Bob Newton used to come past and say, "It's 6 ppm, Joe.", just volunteer that information?-- Bob Newton habitually came into the undermanager's office every morning after alighting from his transport from underground at approximately 6.40, came into the office to discuss things with the night shift undermanager and with the day shift undermanager. During the first few days of that week after the 22nd I did - I always spoke with Bob for one reason or another. Bob and I established a good rapport. On the first few days of the week I remember saying to Bob, "What parts have you got, Bob? What parts have you got?", and towards the end of the week it were a case of I didn't have to ask, he would just said "Gidday, Joe. I've got six again today.", or words to that effect.

You've told us that a rise of 2 ppm is most significant to you in your estimation then?-- A rise of 2 ppm I consider is significant and requires investigation if that rise is over a short period of time. 2 ppm over a number of weeks may not be so significant.

We have heard about the 8 ppm on 22 July and I don't want to go back over that, but that was finally dismissed as being incorrect, wasn't it?-- I thought that a number of people including myself had conducted sufficient investigation to form the view that it was an anomaly.

Yet, I suggest to you that Mr Newton found 8 ppm on 28 July and reported it. Just look at this bundle of documents, in particular production deputy report number 3748?-- Right, I'm with you, yes.

Number 3748?-- Yes.

He reported 8 ppm carbon monoxide?-- Yes, he did.

What did you do about that?-- I cannot remember that being brought to my attention. What day was this? Thursday night
---

28 July?-- Thursday a.m., yes.

I would just like you to go back, if you would, to, say, report number 3743?-- Yes.

There is 5 ppm recorded there, isn't there?-- Reece Robertson's report, second inspection, 5 ppm, yes.

Just go forward to 3747. Mr Bentham reports 1.71 - sorry, 3 ppm?-- Eddie Bentham on the second inspection reports 1.71 metres per second and 3 ppm.

Then we have the next one which is 3748, we have spoken about

that, it's back up to eight, from three to eight?-- Yes.

And look at 3749, it's down to 5 ppm?-- That is correct.

Well, what is that suggestive of?-- It could suggest some of the inaccuracies that I referred to yesterday with regards to taking Drager readings. Before I can fully answer your question what does it indicate, I would like to refer to the Maihak system readings at the same time as I'm looking at this.

I'm not going to ask you to do that, but it's all over the place, isn't it? There is three and there is five and there is eight?-- All different deputies, yes.

Some time after the 22nd and before Monday the 25th Mr Mason had initiated this shift by shift reporting of parts per million, hadn't he, and wet bulb/dry bulb temperatures?-- Correct.

What did you understand the wet bulb/dry bulb to do or why was it being done?-- The wet and dry bulb is a function of determining what the relative humidity is in the air that is being sampled.

But in relation to the state of the mine atmosphere or panel atmosphere what's the relationship? What's the significance of the wet bulb/dry bulb?-- It is a means of determining the temperature of the air and if we do it over a period of time we can determine any trends in temperature changes.

It's, I suggest, relevantly used to determine the heating effect of moisture in relation to coal. In other words, the heat of hydration, or don't you know those things?-- I do know those things, yes. I wouldn't say that I am an expert, but I am aware of them.

That's the real purpose of the sudden initiation of the wet bulb/dry bulb, isn't it, on the - perhaps 23rd, 24th or certainly by the 25th. That's why it was introduced, I suggest?-- Well - on this weekend?

Yes?-- Possibly, but I believe, and I may be sort of diverting a little here, please, rescue people use the wet and dry bulb to determine the relative humidity in relation to the safety of rescue personnel. If the humidity reaches a certain level it may be that the comfort and safety of rescue personnel may be at risk.

Can you tell us why you think Mr Mason introduced the wet bulb/dry bulb on some time over the weekend of the 25th?-- I do not know. I may suggest he did it because it was part of Allan Morieson's system, his weekly Friday system. That's only an assumption on my part and I have nothing to base that on.

I think Mr Morrison asked you yesterday that nobody, whether they be men or deputies, raised the question of a spontaneous combustion in relation to safety with you. Do you recall

that?-- That is correct.

I know that's very broad -----?-- I recall that, yes.

You wouldn't expect them to, would you? You and others, undermanagers up, were the management. That was your role, wasn't it? When I use the term "your" I mean it was BHP management's role to determine those things, wasn't it?-- Yes, it was.

Thank you?-- But, please -----

I'm not trying to stop you -----

MR MORRISON: Let him finish, please.

WITNESS: We had -----

MR MARTIN: Please go on, Mr Barraclough?-- Thank you. We have very well experienced personnel, staff people, mine workers and deputies who are in Mines Rescue who are very well trained in the area of certain facets of spontaneous combustion.

Are you finished?-- I have finished, yes, thank you. Can I go?

I'll come with you. You said that you visited the Unor room

virtually each day to look at the screen?-- No, not necessarily visit the room. I -----

All right, you could see the screen?-- I saw it through the screen from the general assembly area on my many visits across that path during a normal working day.

Well, when you looked at the screen from whichever area, you would have - you should have seen some anomaly in relation to oxygen, shouldn't you?-- Oxygen wasn't a gas - that wasn't a column that I readily searched for when I was looking at the screen, no.

When you were interviewed for your job at Moura - I take it you were interviewed?-- Yes, I was.

Who interviewed you?-- I was interviewed by Phil Reed who was the mine manager. Accompanying him was Mark McCamley, who was an undermanager at the time but he was acting in the absence of George Mason as undermanager in charge, and Mrs Barbara Johnson from the Personnel Department.

You were telling, I think, Mr Morrison yesterday about 18 June when you were underground and you saw, or you experienced a roof fall in the goaf; do you remember that?-- A number of roof falls, yes.

But you spoke about a terrific windblast?-- Yes.

So, that fall occurred when you were there?-- Yes.

Just how violent was it?-- Oh, it's difficult to quantify and describe it. It was sufficient to disturb and blow down brattice stoppings across a roadway seven metres wide by two and a half metres high.

You were speaking yesterday, I think - I have forgotten which of my friends was asking you - you were talking about a chemical smell, a resin smell?-- Yes.

To smell that, I suggest, you would need very low velocity. High velocity would sweep it away and you just wouldn't distinguish it, I would suggest?-- I don't think that velocity, high or low, makes any difference. It's a strong distinctive smell that - even in the main airway, even where there is probably 60, 70 cubic metres per second of air you would still detect it. It's very - it is a strong smell, very strong, very distinctive.

Could I just ask you to turn around and look at the board to my right? Can you see numerous stooks - I will call them stooks - in panel 512?-- Yes.

Some behind large pillars, barrier pillars?-- Yes.

Now, in the curve of the stook, the inside curve of the stook, I suggest, behind the barrier pillar?-- Yes.

It would be almost impossible to get adequate ventilation there?-- I don't agree that it's impossible to get ventilation there. I would agree that ventilation would be sluggish but not - I can't say it's impossible.

I said "almost impossible"?-- Ventilation flow is brought about by pressure difference, and if you have got pressure difference at one part different from another, pressure will flow - sorry, quantity will flow. In some parts it may be sluggish.

Certainly sluggish in the area of the stook I took you to?-- I don't deny that.

You were speaking to - or responding to one of my friends yesterday about the list of duties being communicated and you were concerned and Morieson was concerned, and so I think you arranged for Stafford to talk to Morieson in the interim; do you recall that?-- Correct, yes.

Why was that necessary? Surely management knew the list of duties that Morieson had?-- Sorry?

Surely management knew the list of duties that Morrison had and had to be passed on. Surely management must have known that?-- No, I don't agree that management did know precisely at that time what Morieson's schedule was. Management knew that Morieson had to do various inspections at various times, weekly and monthly. Morieson knew which of those duties he had completed and which still needed to be completed. I wouldn't expect management in that context to know the detail of what still had to be done.

But what if something had happened to Morieson whereby he couldn't communicate, what would have been done then?-- Well, I think the same applies to anyone. Undermanagers have information in their head that they need to pass onto the next undermanager and if they suddenly collapse, that information - I don't see the significance, I'm sorry, Mr Martin.

That's all right, Mr Barraclough. Did you not think to go back over production deputies' reports or mine manager's reports, the mine record book after you experienced the 8 ppm on 22 July, or the undermanager's shift reports for that matter?-- I do not recall that prior to the 22nd that the deputies were regularly and consistently reporting the information that referred to the 8 parts in terms of they were not reporting parts per million.

All I asked you is: did you not think to go back over records such as that?-- No.

You spoke yesterday about an exercise which was considered but abandoned, that is, a total evacuation of the mine; do you recall that?-- Yes.

Why was that considered?-- We considered should we not just ring the telephone and say to everybody get out of the mine straight away.

But why? Why run that exercise?-- It's training, it's preparation, it's to assess people's ability to deal with the situation, see what happens when it's done.

Yes, but that's really forecasting, isn't it, a disaster underground, otherwise there is no necessity for the exercise, is there?-- It is established throughout industry that that is a wise thing to do.

Because of the potential for disaster?-- Because of the potential for fire, flood, inrush or any other major incident.

You didn't - when I say "you", I really apologise because I really mean BHP management - BHP management didn't need a Trade Union to tell it what the dangers in a mine were, did it?-- In itself BHP did not need that sort of communication, but BHP, portraying the style of management that it does, it will encourage and elicit people to make contributions.

And neither would it require that sort of input from the Inspectorate. It has all the expertise and all the people to advise it within its umbrella, hasn't it? It has been mining coal, after all, for 60-odd years or more?-- Yes. The operation of a coal mine, in my opinion, is not just left to the owner and the manager. There are a lot of other people inside and outside the organisation that play a part in its operation.

I have nothing further, thank you.

MR HARRISON: I will go beyond 11, Your Worship. Does that worry you?

WARDEN: We will take the break now and let you start afresh. Thank you.

THE COURT ADJOURNED AT 10.50 A.M.

THE COURT RESUMED AT 11.11 A.M.

JOSEPH BARRACLOUGH, CONTINUING

MR MARTIN: Before Mr Harrison starts, I would like to tender production deputies' reports, 3733 to 3759 inclusive for the period 23 July 1994 until 31 July 1994, being the period of acting managership since the introduction of the wet bulb/dry bulb readings and the CO in parts per million.

WARDEN: That's Exhibit 169.

ADMITTED AND MARKED "EXHIBIT 169"

CROSS-EXAMINATION:

MR HARRISON: Mr Barraclough, can I ask you some questions about training of personnel at No 2 in relation to spontaneous combustion? As I understood from what you told us yesterday and touched on again today, there was some element of spon com training, if I can call it that, in relation to new inductees after you came there?-- That is correct.

But not in relation to people that had been there prior to that?-- That is the case, yes.

And that would include people at the undermanager's level such as Michael Squires, Terry Atkinson?-- Yes.

Now, the spon com training for the inductees, you were able to get some information from the document you were questioned about earlier by Mr MacSporran and Mr Martin; is that correct?-- Yes.

And did you compile something yourself over and above that?-- Yes, in all the training modules, one uses the material as supplied by the Queensland Coal Association package, but obviously one adds to that one's own experiences and teaching skills and things-----

So - sorry, I didn't want to cut you off?-- The package is only sort of a part of any teaching process anyway.

Now, turning to what you said yesterday about your knowledge of CO make prior to the explosion?-- Yes.

You certainly didn't have the knowledge in terms of the parameters of 10 lpm and 20 lpm that had been spoken about so often in these proceedings?-- That is correct.

You didn't know that 10 meant "should investigate", 20 meant "big problems"?-- It is a simple matter to assess litres per minute simply by obtaining velocity and known cross-sectional area and parts. That's quite simple.

I am not talking about how you calculate, I am talking about the relevance of certain specific readings such as 10 and 20?-- Yes.

All right. Now, I take it from that, because you didn't have that knowledge yourself, certainly the course you did do for the inductees wouldn't have involved that information either?-- That is correct.

Now, again - correct me if I am wrong - but as I understood your evidence yesterday, you were planning to include some training in relation to spontaneous combustion in the five year refresher courses for existing employees?-- Yes.

And that's something we - you had made inquiries of the Queensland Mining Council in relation to those publications - the red book and the blue book?-- Yes.

At that stage you were unable to get those publications, being informed that they were out of print or not available?-- Yes.

And other priorities then took your attention and the course itself was not formulated?-- That is correct.

But it was something that you had intended doing?-- Yes.

Just turning to your understanding of CO make generally, would it be fair to say that, as you saw it, was another thing to assist you in terms of looking at trends?-- Yes.

You were no doubt familiar with the graph that was put out by Cocky Morieson, initially every second Friday, I think it was, and thereafter every Friday?-- Correct.

Were you familiar as to how that was calculated in terms of a weekly average being taken of Unor readings, for example?-- Weekly average from the Maihak Unor, yes.

I should go back one. Did you from time to time look at that graph?-- Yes.

It was available in the undermanagers' cabin?-- Yes.

Deputies' cabin?-- Yes.

Was it there for general publication for all people to see it at the start, for example?-- I do believe that it was there in the undermanagers' office at all times. It was in the deputies' office at all times and it was on the general assembly area notice board. I cannot say that it was there every time. I cannot recall. But it was certainly there from time to time.

In terms of that being a guide to you of any problems within the mine, was it the case that when you looked at it, you looked to see whether or not there was any sharp increase, say from point to point - in other words, from week to week?-- Yes, it was - the reason to look at it was to see what was happening - was there any rapid, major change over time.

Now, the understanding that you had of the use of that graph for trend purposes, if I can call it that-----?-- Yes.

-----did that appear to you to be a widely held understanding, say at undermanager level at No 2?-- I cannot answer that. I don't know.

Were you aware, for instance, of any other people who may have held a view to the effect that 10 indicates a need to investigate, approaching 20 indicates big trouble?-- I'm sorry, I don't know. I can't answer that.

It is something that you have never heard - it is not a view that you have heard anyone else there express throughout the time you have been there?-- No.

CO make itself, can you recall times where it has ever been the subject of discussion between you and other people at your level - at undermanager level?-- No.

Could the witness be shown Exhibit 160, thank you? This is the extract from the mine record book that you were shown earlier today. If I can just ask you generally about the book? I take it you have got some familiarity with the mine record book, not only at Moura but through your earlier experiences as manager at Collinsville?-- That is correct, I have had many years experience with this book, yes.

Now, from your experience generally, is this book something which is perused by the officers from the inspectorate when they come to do their regular inspections at a mine?-- I cannot recall it being perused on the 27th when Mr Mike Walker came.

You are probably getting ahead of me. I was asking more from your general experiences in practice?-- Over the years?

Yes?-- Over the years the inspector in Collinsville used to peruse the book and read entries that had been made since their previous visit to the mine.

And from your experience would members of the inspectorate in those circumstances raise with you any concerns they may have from information contained in these reports?-- That is exactly right, yes.

Now, you acted as manager from time to time at No 2?-- No 2 Moura?

Yes?-- No, sir, I acted on one occasion only.

So, it is only this occasion-----?-- Yes.

-----that we have spoken of. Now, throughout that time was there only the one inspection from the inspectorate?-- Yes.

On 27 July?-- Whilst I was manager, that was the only time, yes.

Now, getting back to what you said before, was it the case that Mr Walker who came on that occasion didn't look at the mine record book, or is it the case that you can't recall whether or not he looked at the mine record book?-- I don't recall. I may have left Mr Walker from time to time to go and attend to some inquiry someone might be making or to go and get changed to go underground, and Mr Walker may have been alone in the room with the book, but I do not remember being with him if he did look at it.

Now, the reading itself at that stage, and I stress at that stage, the reading that you wrote in the book of 14.9 lpm didn't specifically mean much to you?-- No.

I take it with the benefit of hindsight it may now mean something more to you than it did then?-- It certainly means a lot to me now.

On that day, did Mr Walker express any concerns to you at all about the CO make in 512?-- No, I do not recall any discussion about that matter at all.

Either by reference to the mine record book or by reference to the graph which we have discussed which was displayed in certain sections of the mine?-- I cannot recall any of that, no.

That graph, I take it, as displayed - as at that date - would have been up to date to the 22nd of July; would that be right - the previous Friday?-- To the previous Friday I would expect, yes.

And would have shown what I may term the high reading and the low reading from the previous Friday, or just the low reading?-- It would have shown the last reading calculated by the computer. I would expect that to be the case.

How many people came from the inspectorate on that particular day?-- I think we had both Mr Mike Walker and Mr Alan McMaster there.

Did you go with them on a general inspection of the mine? Was that part of the routine?-- I specifically accompanied Mr Walker, but I do recall somewhere in the mine we did cross paths. Dennis Evans, the electrical engineer, was with Mr McMaster and I was with Mr Walker, but at different times, but we did cross paths somewhere in the mine.

You were with Mr Walker at different times but not all the time; is that the case?-- Sorry?

Were you with Mr Walker all the time he was there?-- Yes.

Now, did he appear to you to take any note of the information that was up on the walls in the deputies room and the undermanagers' rooms, Jacques Abrahamse's office, George Mason's office?-- I vaguely remember some conversation in respect of, "Where are we mining today?", and I remember pointing out that, "This is where we are mining here, and this is where we are mining in this other place, and this place is not working today.", and things like that, looking at the mine plan.

You don't have any recollection as such of him having regard, for instance, to any documents that may have been up on the noticeboards on the walls of those offices including the CO make graph for 512?-- Not that I can recall, no.

Could the witness be shown Exhibit 109, thank you, Your Worship? Again I think you had a look at this earlier today?-- Yes.

This shows a series of subsequent CO make calculations after 22 July. Do you see those there?-- Yes.

I think it's - "page 2" it's headed up, but it should be the first page of the exhibit?-- Yes, I am with you, yes.

We see 13.7 to 22 July being what we might call the second calculation for that day?-- p.m., yes.

The 13.42 for the following day?-- The Saturday, correct.

The 13.57?-- Friday, 29th.

14.27?-- Friday, 5 August.

With a final one of 16.66?-- Saturday, 6 August.

Now, in terms of what you've told us of the trend, what you looked for by way of trend on a CO make graph, the readings up to the time that you ceased as manager, so that would be what you knew the week before, that you had written down at 14.9 coupled with the one of 13.7, bearing in mind you had accepted the first calculation for 22 July to have had some problems, and the following one of 13.42. On a trend basis I take it they wouldn't have alerted you to anything?-- That is correct.

Even though you may now know, for instance, that even those levels of 13 could well have suggested if not a problem a very serious need to investigate things?-- I now know that that is the case, yes.

If I can take you back to the manager's report contained in that book, Exhibit 160 for 15 July, the one that you've said earlier that you signed, you've got the entry there, 14.9 lpm?-- I'm sorry, I do no longer have the exhibit.

Sorry, I didn't realise they were that efficient. Better than my crew. You were referred earlier by Mr Martin to the figure for 14.59 for the previous week. I think it was contained in

another document, not that one?-- Yes.

What I wanted to ask you was could that have been an error in transcription on your part, taking information from one to the other, 14.59 to 14.9?-- In hindsight now that I've - and I didn't recognise the two entries that had been made, the 14.9 and the 14.59, I believe that I made an error transposing one figure and writing it differently in the record book.

I take it the reason you would say that was that there was no other documentation you would have had recourse to?-- That is correct. I am not aware of any other document that I saw that could lead me to put 14.9.

Now, if I can turn the manager's reports over one page - I think it's page 25, my copy is partly blotted out?-- I am with you, yes.

There is an entry there under 512 Panel which was read to you earlier by Mr MacSporran, I think?-- Yes.

6 ppm (14.9 lpm)?-- Yes.

Now, you said yesterday in evidence that as far as you were aware there was not any real difference between CO parts per million and CO make providing the ventilation quantities remained the same?-- That is correct.

Could it have been the fact that you recorded that figure again and could that have been related to the fact that you assumed that the 6 ppm represented roughly the same as the readings had been previously and adopted again that figure of 14.9 that appeared previously?-- I believe that is what I did.

Again I take it there wouldn't have been any other documentation available to you or anyone else at that stage to get that information?-- No.

You mentioned in evidence both yesterday and today how Bob Newton kept reporting back to you about the levels of carbon monoxide in 512?-- Yeah, when you say he "kept", probably once or maybe twice.

I'm not saying -----?-- The week was only five days long anyway.

I'm not saying he specifically went out of his way to talk to you, it was something he mentioned whenever you came across each other?-- Yes.

You knew him as a regular 512 deputy; is that right?-- Yes.

Has it been your experience that in terms of monitoring what's going on in a particular panel, someone at your level, at undermanager level, tends to rely perhaps more heavily on those that are more experienced in that particular panel, say, than others in terms of information they may gather, reports they may make?-- Yeah, I think - yeah, I think it is a

natural thing to do that. If you have a deputy that is continually, permanently in a section you look upon him as being somewhat more knowledgeable of the circumstances than what you would a temporary or just once in an event thing.

You mentioned this morning that there were a lot of experienced people in the mine, particularly a lot of people experienced in Mines Rescue. Did you know Bob Newton to be one of those experienced in Mines Rescue?-- I'm sorry, I can't answer that question, I don't know.

Len Graham?-- Lenny Graham certainly, yes.

John Blyton?-- Certainly, yes.

Now, you spoke yesterday and today of your knowledge of the incubation period for Moura coal generally?-- Yes.

You've told us, and I won't repeat it, how you had gained your initial knowledge?-- Yes.

And you said yesterday that this was something which was discussed at the Minerisk analysis meeting which you referred to?-- Yes.

And basically all people there seemed to be of the view that it was six months, and as I understood what you said, the facilitator from ACIRL did not express a different view?-- That is correct.

To your knowledge was that a view that was generally held amongst people that worked at the mine, that the incubation period was six months?-- I cannot answer and say that people at the mine knew it was six months. I do believe that there was a general view around the place that it did take a period of time for spontaneous combustion to get to serious situations.

Can I put it this way: you weren't aware of any contrary view amongst those that worked there?-- No, no.

You've known Michael Squires throughout the time you've been there?-- I've known Michael Squires since I joined BHP Moura in March '92, yes.

Would it be fair to say that he presented to you as a person who was concerned about safety matters?-- I would say yes, he was.

Certainly not a person who placed a low priority on safety matters?-- No.

Thank you. I have nothing further, Your Worship.

RE-EXAMINATION:

MR CLAIR: Mr Barraclough, just briefly, you mentioned in answer to questions from Mr Morrison about this event on 18 June was subsequently identified as being when you were present when there was a fall which produced a windblast that knocked down some stoppings. Do you remember that? 2 and 3 headings?-- Yes, I do remember that.

Did you, in the course of your inspection, discover just where that fall had taken place?-- No. No, we couldn't do that.

You did say that on that same occasion you went down No 1 heading and across 13 cross-cut. You mentioned that a stopping had been deliberately opened, and I just missed this, but which stopping did you notice had been deliberately opened?-- The stopping between 12 - the stopping in 12 cut-through.

The stopping in 12 cut-through between 1 and 2?-- Yes.

That was still open when you saw it?-- Yes.

And you said that was to allow air to flow out of the goaf?-- Yes.

In effect to open up that corner?-- Yes.

Do you know yourself whether steps were taken to close that at some stage or when such steps might have been taken?-- I am not aware of that.

You mentioned also on that occasion the strong smell of roof bolt chemical?-- Yes.

That's quite a different smell, is it, from the carbon monoxide smell?-- Carbon -----

That's quite a different smell, is it, from a carbon monoxide smell?-- It's a different smell from anything else that I have experienced. It's a very distinctive smell. It's different from any other smell, completely different.

You mention that it was very strong - or strong, I think you said?-- It was strong. I can't define strength in terms of degree, but, yes, it was a strong smell.

If there was any other smell there by way of a slight tar smell or benzeney smell, the smell of the roof bolts, would that have been sufficiently strong to mask any other smell?-- Possibly it could, but -----

It would depend, of course, on the strength of any other smell. I appreciate that, but I'm just asking you in terms of gathering what strength the roof bolt smell might have been -----?-- From what I can remember we detected the smell as we walked down the top return No 1 heading. By the time we got

to the bottom and travelled along 13 cut-through it got less and less and finally disappeared.

As you went across the back of the panel?-- Yes. My understanding was that the collapsed chemicals in the goaf had been swept away by the air stream, carried away, and as we went inbye the smell just disappeared.

And, of course, you made that journey down there only shortly after you had sensed the windblast from what was -----?-- Yes, we were travelling down that return something like 10 minutes after the fall.

Thank you. Could the witness see Exhibit 152, please, Your Worship? You were asked a number of questions about your reliance, as it were, on the parts per million and you did tell the inquiry about your morning contact with Bob Newton who was the night shift deputy during that week commencing Monday, 25 July?-- Yes.

You did say that at the beginning of the week you were asking him, but towards the end of the week he would come and tell you -----?-- Yes.

----- what the reading was. Go over to the third page of that document. I see that you are distracted by what's on - maybe the fourth page there?-- The tabulation?

Yes, the meaningful part of the document. That's it. Over there where there is a table?-- Yes.

You will see that that table sets out in fact various items, amongst other things a calculation of the CO make from the Drager tube reading and in the column immediately to the left of the Drager tube reading is the Maihak reading at the same time?-- Yes.

I would like you to go down to the 28 July '94 entry and you

will see that the Drager reading that's recorded there is 8 ppm?-- Yes.

I won't take you back to it, but in the course of questioning by Mr Martin you were shown a deputy's report which in fact showed that reading; do you recall that, one of Mr Newton's? It's part of Exhibit 169?-- I remember, yes.

A bundle of reports you saw just before the break?-- Yes.

This is the calculation, you see, that relates to that?-- Yes.

Now, first of all, can I ask you this: can you explain how it would be that you wouldn't have become aware of that 8 ppm reading given that that was a reading by Mr Newton on his night shift during that week when you were following with some interest the Drager tube readings that had been taken particularly by the night shift deputy?-- I cannot explain that.

But you have no memory at all of that 8 ppm being drawn to your attention?-- Certainly not.

Either by way of you asking Bob Newton or by way of him volunteering it?-- It may be that I didn't actually see Bob that morning, I don't know. I just cannot remember. The 28th would be, what, Monday - Thursday.

The 28th was a Thursday?-- I can't recall.

Of course, the system was only set up on the weekend, the previous weekend, and, in effect, this is the fourth day?-- Yes.

Monday, Tuesday, Wednesday, Thursday, the fourth day when this system was in place?-- Yes.

And given what you said about actually making inquiries initially and then the practice being Bob Newton telling you the reading, it seems unlikely that either you wouldn't have asked him or that he didn't tell you when we are only into the fourth day of this new system?-- Or I wasn't present at the time.

Anyway -----?-- I certainly was not aware of 8 ppm.

Now, just while we are looking at that table then, you see that that 8 ppm with the wind velocity that was measured on that shift actually calculates through to 19.36?-- That is correct.

I know you are not a litres per minute man, you are more a person who looks at the CO in parts per million, but would that 19.36 have been something that would have given you some real concern?-- The figure itself would not have given me concern because, as we have discussed previously, I was not in the knowledge of the difference between 10 litres and

20 litres. Obviously 19 is more than 13, and I would have viewed that as being part of the linear regression of the total CO make throughout the system.

Yes, yes. Well, you may have to see it on a graph to be able to make any judgment as to whether it fitted into a linear regression, as you say?-- That is correct.

But the 8 ppm, I think you have already said that that would have concerned you if you had been aware of that, given the readings that preceded and succeeded, isn't that so?-- Yes.

It would have really concerned you?-- It certainly would.

And, of course, the shame of it is that it appears, one way or the other, it didn't come to your attention; is that right?-- It did not come to my attention and it would have concerned me. I was concerned on the 22nd about 8 parts. I certainly would have been concerned about 8 parts on the 28th.

And if you had been made aware of it and you had experienced that concern, what would you have done at that stage?-- I would have caused some investigation to be undertaken.

Just one further point before we leave that document. You really made your judgments on the basis of the CO in parts per million on an assumption that there would be constant velocity. That document actually has a column there which shows you the velocity in metres per second that were measured by all those various deputies -----?-- That is correct.

----- on the shift, and you see really quite a considerable variation in the velocity over the period that's covered by that table, don't you?-- Apart from a reading of 1 on the 25th from Steve Bryon, a velocity of 1 -----

Well, put that to one side because there was only one fan running at that time?-- Yes. I would, looking quickly down this table, see a range of 1.84 probably as a maximum.

1.85?-- 1.85.

On 27 July?-- A minimum of 1.7 - 1.66, 1.68.

Or 1.55?-- Sorry?

1.55 on 5 August?-- Correct.

Second reading on 5 August?-- Correct.

Comparatively quite a significant variation?-- There was a variation.

Significant range, okay. Just one final matter: I did ask you some questions about your view on the efficacy of a computer system to record what I referred to as alarm events that can stay on the system and alarm until they are accepted. Do you remember we canvassed that when I was questioning you yesterday?-- I remember that, yes.

Would you - given some questioning in respect of the matters that might be properly drawn to the attention of an inspector when he comes - would you envisage that as part of that system that it would be easy enough to incorporate a facility whereby the alarm items that had been, or incidents that had been recorded in the system are readily recalled so that a visiting inspector of mines can have a look and see very readily what items have been entered, first of all, and, secondly, whether they have been acknowledged and, thirdly, who has acknowledged them?-- Are you asking me my opinion as to the technical possibility of that being achieved?

Yes. Would you see any difficulty in that?-- I would believe today's technology is sufficient to be able to do that.

And would you believe that that would be a beneficial aspect of such a system?-- I would believe so, yes.

Thank you, Mr Barraclough. Thank you, Your Worship.

EXAMINATION:

MR PARKIN: Mr Barraclough, when you start at a mine -----?-- I beg your pardon?

When you start at a new mine, is not one of the first questions you would ask is, "What is the history of this place?"?-- I would believe that would be a fair - a reasonable thing to do.

Why didn't you do it then?-- I probably did in many respects, "How many people do we have here? What's the history? What sort of roof do we have? What's the fan's quantity? What's the water gauge?"

I guess the point I am trying to make is that you knew it was a gassy mine?-- Yes.

You knew the previous history in '86?-- Yes.

But you didn't know that they had had a previous history as regards spontaneous heating?-- No.

Do you think that's - I mean, you are the safety/training guy at the place and you didn't know that there was a previous spontaneous heating at the mine. Do you view that as strange?-- I do remember during my interview with Mr Reed asking the question, "What are the major problems that we have at the mine?", and he referred to methane, and I do remember asking him, "Well, what is the percentage at the fan?", and I think the answer was something like .6 or .7 or something, .4, .6.

But do you accept that in your capacity, you should have known that Moura was liable to spontaneous combustion and that it had a previous history of a heating?-- If I were to go all over it again, yes, I must agree with you.

You stated that the training was only carried out with new inductees with regard to spontaneous combustion, and I guess the other point I was going to make was: is that strange that other people weren't taught anything about spontaneous combustion with the history of Moura in mind?-- I must agree that is strange, yes. On reflection after the event we should have obviously done spontaneous combustion training.

Can I just come to this Unor system? Was there a systematic control of the Unor system at Moura No 2?-- There was a systematic servicing. I am not aware of any systematic controls that were in place. I had my own mode of operation, my own controls, but I am not aware of any systematic control.

Do you think with such a system that a proper operating procedure would have been helpful?-- It certainly would, yes.

Because the question I have got here is: how many people could accept alarms?-- I cannot quantify that question.

Were they authorised to accept alarms?-- I do not believe authorisations existed in that sense.

I mean, did they have any training?-- I had training. When I started as undermanager I requested to be trained on the operation of the system, "Refresh my memory, please, explain how to accept alarms.", and so on, and I did receive that training.

I mean, in your opinion, is it good mining practice for anyone to accept alarms?-- No, it is not.

You are an experienced mining engineer, Mr Barraclough, and I will just raise this question with you in terms of cable flashes. Now, we have heard previously that some six to seven were reportable each year at Moura No 2, on average?-- Yes.

Do you believe that's high by industry standards?-- I'm not aware of cable flashes throughout the industry. I'm not aware that logs are kept and comparisons are made in that sense. I can try and answer your question, if I may, and refer back to the discussion that was held between Mr Mike Walker and Reece Robertson on the 27th in the 512 Panel. The major part of the discussion between Mike Walker and Reece Robertson was relating to cable flashes, and I cannot remember how the discussion started, but Mr Walker did say that Moura is not good with regards to the number of cable flashes, and Reece Robertson's response was something like, "Yeah, we look bad because the others don't report them anyway."

Well, for instance, how do you compare them to those at Collinsville?-- We did have cable flashes at Collinsville, yes, because we operated the same equipment, the same sort of

people doing the same sort of operation. I am sorry, I cannot give a number as to whether Collinsville would be six per year like Moura; I can't answer that.

Now, during cross-examination by Mr Clair I think you mentioned, if I heard you correctly, smoking in the lamp room at some stage. Would you care to elaborate on that statement, thanks?-- The lamp room was a sort of unofficial meal room at times and people not only collected their lamps and then deposited their lamps at the end of the shift, but during the shift people did sit in the lamp room and eat their meals and smoking did take place, and as I explained in our safety committees where we did surveys and we measured people's response to peer pressure, for example - and I used the example of the safety clips in pressure hoses - we did the same sort of survey with smoking in the lamp room, and there is a sign there that says "No Smoking", and we did surveys, and I forget the figures. Of all observations we had probably 60 per cent compliance with the notice, "No Smoking", and then after the peer pressure sort of took effect, that gradually reduced to 100 - increased to 100 per cent compliance. It was just part of the growing awareness of safety. Yes, smoking was allowed - was conducted in the lamp room and it was eventually eliminated.

Because, of course, that's a very dangerous practice, as we both know?-- Of course it is, and that's why -----

You eradicated the -----?-- That's why we took the steps to eliminate it.

When did you do that, when you started at the mine?-- We did that when the safety committee became active in early to mid 1994.

Thank you. Were any safety audits conducted at Moura No 2, either internal or external?-- Yes, there was. BHP initiated an audit undertaken - I certainly cannot remember the date, but it would be approximately 1993. Mid 1993 would be my best guess.

And that was an external audit?-- That was an internal audit initiated by BHP.

Who constituted the team of people on the audit?-- The Operations Manager, who was the Senior Executive Officer for BHP Australia Coal, including all the BHP mines, open-cut, and obviously No 2 was the only underground at that time, John Grubb, he headed the team. He was accompanied by Mr Stan Thielke who is the Senior BHP Safety Executive based in San Francisco, he came over for the audit; Mr Alan Brecknell who was the mine manager at the time; I was present, so was George Mason, Albert Schaus; people from the Brisbane BHP office also took part in that audit, bringing a total of about 12 people.

Were all the audit findings documented?-- Yes, they were.

Was there an actions column for people to follow up on actions that should be taken?-- Yes, there was.

Were they all completed?-- I believe a substantial number were, and possibly all were completed. I can't be really definitive on that.

Mr Barraclough, can we just return to ventilation? During the three weeks you were manager, who was in charge of ventilation?-- Allan Morieson was the ventilation officer for the first week and then for the latter two weeks of my three week spell it was Steve Bryon.

I guess the question I am trying to ascertain is: is the manager ultimately responsible for ventilation at Moura No 2?-- The manager is ultimately responsible for everything, including ventilation, yes.

So, during the three weeks you were in charge of ventilation?-- Yes.

Can you tell me: during that three weeks, to your knowledge, was there a working ventilation plan at the mine showing the quantities in each district and the establishment of the Unor points throughout the mine?-- The establishment of the Unor points was clearly displayed inside the monitor room adjacent to the monitor screen. I am not aware of a plan which showed on a weekly basis the quantities in each section. We certainly had a monthly survey which actually did show the quantities in each section.

So, you did have a monthly survey?-- Yes.

What about when you are sealing - when you do a more frequent survey when you are going towards a sealing, or actually sealing?-- I would have thought that was a wise thing, but whether that actually took place, I do not know.

So, you could get information, but it was a month old - could be a month old?-- It may have been done on more frequent occasions, but I do know that it was monthly.

Can we just move to 22 July, please? I think I understood you to say that you did not look at any graphs to ascertain a trend of CO; is that correct?-- No, I looked at the graph that was produced from the tabulation, which was produced from Jacques Abrahamse's computer.

Can the witness just be shown Exhibit 21? I think if you look at 15 pages from the front, you will see the CO make for 512?-- Is this in tabular form or a graph?

This is graph form?-- Right.

So, it has been established, and I was rightly corrected by Mr Morrison, that the goaf was flushed on either 10 or 11 June - do you see that point?-- Yes.

And then on 16 June we have a make in litres per minute of 7.3, and I realise you said earlier in your statement that you weren't familiar with make in litres per minute. The question I'm coming to is a trend?-- Yes.

Then if you look on the 15th - and this graph, I think, was available on the 15th?-- Yes.

You have got a reading there of 14.59 lpm of CO?-- Yes.

Now, that indicates that the CO make has doubled in four weeks. Would that give you some concern if you had looked at that graph?-- I think I tried to express my views some time yesterday under questioning where I said that the rise over that period of time was not dissimilar from the overall trend of the graph.

But, I guess the question I'm trying to ask you is, you know, if you are looking at trends, if you know nothing about the litres per minute and you are looking at trends, that trend - would that cause you some concern?-- I am aware that during the oxidation process that heat is produced and carbon monoxide is produced, and over a period of time, obviously there will be a rise in trend. With that in mind, I also add cognisance of the Graham's Ratio.

Well, can I ask you this question: you were the manager in charge of the mine for three weeks and yet we have got deputies, we have got the ventilation officer, Mines Rescue personnel with knowledge of litres per minute and yet you are the manager of the mine, and also in your other capacity as safety and training officer, and you are not familiar with it.

Now, do you find that a bit odd?-- I am not familiar with the concern that's been expressed in recent text material of the limits of 10 - or the figures of 10 and 20 litres. On the 22nd of July, when we had the 8 ppm scare, I did - one of the questions I asked Jacques Abrahamse during the discussion was: what is the shape of the 512 graph in relation to other graphs, and the answer is what I would have expected it to be anyway - is that it is showing a similar rise in trend.

Well, I guess the other point is that Dave Kerr, who went underground on the 22nd, was concerned enough to go underground when he knew the situation - I mean, didn't you have discussions with the ventilation officer about that trend?-- I think we did have discussions about the trend, and the trend is what one would expect during a retreating section.

Okay. Let me ask you another question: Mr Kerr stated in his evidence that if he had known about the reported tarry smell that McCamley reported on 17 June and the benzeney type smell that Robertson reported on 24 June, and the increase in CO, he would have had a problem, so I ask you the same question?-- Yes, sir.

What would you have done about it?-- I would have had a problem.

What would you have done about it?-- About? About the tarry smell?

Yes, about the smells and the increase in CO accompanying the smells?-- The smells occurred at a time before what you are now addressing me with.

Sure?-- As I have explained on a number of occasions, I don't know anything more dangerous in a mine than smell and hazes, and I cannot accept that we have had them and they have not been reported and they have not been followed up.

Okay. Would you say that's indicative of good communication or bad communication at Moura No 2?-- If, in actual fact, a smell was there and it was determined as being a smell - benzene, tar, or whatever - and it wasn't communicated, we have got major communications problems, yes.

Well, it obviously wasn't communicated because you didn't know anything about it?-- That's right, but I'm not sure that it existed either.

I'm afraid I can't answer that question, Mr Barraclough?-- Sorry, I shouldn't be asking you a question.

I can only go on what people state in this Inquiry?-- Yes, that's right.

I mean, our business is to ascertain the facts, and they are the facts that we have got at this moment in time. I guess the other question is that, you know - this is on ventilation - we have heard from numerous witnesses that there were

ventilation problems in 512 - recirculation has been mentioned, dead spots - now, you said in your statement that you were not aware of any ventilation problems in 512; is that correct?-- That is correct.

Again, does that indicate good communications or bad communications? I mean, you are the safety training officer?-- My major day-to-day operations were in connection with safety, in connection with personal injuries, in connection with training, persons being authorised, updating people's knowledge on a lot of things at the mine. I was not involved, except during my spells as undermanager on weekends - I was not involved with the day-to-day running of the mine. I did frequently look at deputies' reports, maybe for a specific reason. I did read regularly undermanagers' reports, and on all of those sort of things I did not pick up any sort of adverse comments relating to ventilation in 512.

Mmm?-- I am sure if we had reports four or five times a week that we had problems in 512 I would have picked it up.

Let me phrase this question another way: in your own mind, do you believe that you had sufficient knowledge in a handover from the manager to conduct those duties for three weeks?-- I considered so, yes.

Do you still consider so?-- I do, yes.

Can I just ask you one final question: you have stated on several occasions that your education regarding spontaneous combustion was through the Graham's Ratio?-- That is correct.

What reading would give you concern?-- The text material I remember says something like 0.5, 0.4, but that depends on what might be the base or the norm from which we are starting from, or I would have become concerned if we were getting - during a normal operation and not at sealing times - during normal operations, I believe I would be becoming concerned with a ratio in the region of 0.2.

Well, look, I know for a fact that you were away from 5 August, but let me put this question to you: if you had have been aware that the ratio was in excess of 0.5 and that the CH4 was approximately in the region of 3 per cent CH4 practically 12 hours before the incident, what would you have done?-- Was this post or pre-sealing?

This is pre-sealing - 12 hours before the incident?-- I would have had to make investigations, call on resources - internal, external - to assist me with what I would have thought would be a problem.

So, you would have had a problem?-- I believe we would have had a problem with the analysis that you have just given me.

You would have taken some action?-- Yes.

Thank you. I have no further questions.

EXAMINATION:

MR NEILSON: Mr Barraclough, most of my questions have already been asked, but this safety committee that you established, at any time did you discuss the element of spontaneous combustion?-- No.

Had you ever been approached by anybody at any time to instigate a spontaneous combustion training program?-- No.

Not at all?-- No. The mine manager - if I can answer that, the mine manager knew I was working on preparations to do it.

Thank you.

EXAMINATION:

WARDEN: Witness, just take a look at those documents placed on the table. What's the title of the first booklet?-- The title of this greeny coloured one is "Queensland Mineral Industry Study Centre 1995 Course Booklet".

Thank you. Turn to page 819. I have flagged them for you. Just quickly peruse down those modules and the subjects it covers?-- Yes.

They appear to be subjects and study modules of vital concern to the industry?-- Yes.

Thank you. Go to the next page I've flagged. It is a flow chart of certain things?-- Yes.

Ends up with a degree in mining?-- That is correct.

Covers all the courses up through deputy and mine manager?-- Yes.

Appears to be entirely appropriate?-- Yes.

Thank you. Just read the title of each booklet as you come to it - not the course number, but the title?-- "Hazard Management, Underground Coal Mines".

Ever seen that before?-- No.

Next one?-- "Fluid Flow, Surveys and Network Analysis".

Ever seen that one before?-- No.

Next one?-- "Air Flow Ventilation Monitoring".

Ever seen that before?-- No.

Thank you?-- "Occupational Health and Safety".

Ever seen that before?-- Yes.

Thank you?-- "Mine Safety".

Have you seen that before?-- No.

Thank you?-- "Basic Ventilation Practice".

Ever seen that before?-- Yes, I have.

The ones you have seen before, are they available at the mine?-- I have never seen them at the mine, no.

So, you don't use them?-- No.

Would the training records held at the mine give any indication if Morieson or Bryon have done that basic ventilation course?-- No. The records at the mine-----

Are only internal?-- My records at the mine would not show that - sorry, could I rephrase that? It may well be that some certification relating to Allan Morieson doing some ventilation course may be in my filing system at the mine, but I cannot recall it.

Thank you. I don't propose to tender them. They are available if you wish to look at them.

EXAMINATION:

PROF ROXBOROUGH: Mr Barraclough, you have said you had an involvement in the risk assessment for panel 512?-- Yes, I have, sorry.

This was undertaken in April 1994?-- Correct.

The panel started operations in February 1994?-- No, I think the extraction section started some time later than that.

Yes, I appreciate that, but what I'm trying to get at is that the design of the panel, the method of working, was already in existence in February 1994?-- Yes, sorry, yes.

So, to a large extent, the die was cast, wasn't it, with regard to the operations in panel 512? What I'm trying to get at is wouldn't you expect a risk assessment to be carried out before the design of the panel and the working method have been confirmed?-- The risk assessment was specifically aimed at the extraction part of 512. It was specifically aimed at eliminating injuries during the second workings - the extraction workings.

Does that mean there were no risks perceived during the development phase?-- I'm sure there were risks perceived and that's why the analysis was undertaken.

But would it be unfair or unreasonable for me to infer that the risk assessment was done as an after-thought?-- The risk assessment was done for the extraction and it was implemented within a few days or maybe a week or so after commencement of extraction.

But surely there would be less opportunity to design out risks once the panel itself and the procedure had been established?-- Okay. I think what you are saying is that the parameters for the design had been set and we developed the controls derived from the risk assessment around an established layout.

Yes?-- Yeah, that is the case.

Were risk assessments done on any other panels, or was this the first occasion where a risk assessment had been done?-- This was the first mining risk assessment that was undertaken. We had undertaken risk assessments in relation to new equipment and new procedures and things, as I have explained earlier.

You said - and you have repeated - that you did not include spontaneous combustion in your list of principal risks at Moura?-- That is correct.

And I think you said that this view was shared by other people at Moura - I think you said "including the inspectorate"?-- Yes.

Can you tell me, is monitoring of carbon monoxide a statutory requirement at all underground coal mines in Queensland?-- The monitoring of carbon monoxide and Graham's Ratio is a statutory requirement in Queensland, yes.

At all mines irrespective of the propensity of a coal -----?-- At all mines.

Now, you were trained in Britain, presumably by and within the National Coal Board; would that be right?-- That is correct.

The National Coal Board training program, induction, refresher and on-the-job training is often held as a paragon, as a model, as to how it should be done?-- That is correct. I believe so, yes.

How do you think training at Moura compares to training within an organisation like the National Coal Board?-- I would say that the training within Australia and within Queensland is probably not up to the standard that we had in the National Coal Board.

What about within BHP?-- I think the same thing within BHP.

Is there any reason why the highest international standards should not apply in Australia or particularly to within BHP?-- I cannot answer that question, sorry.

Now, Moura is a relatively small part of a very large company?-- That is correct.

I think you've in earlier evidence suggested that you had some involvement with senior personnel within BHP on safety matters I think in answer to Mr Parkin you referred to the audit?-- Yes, yes.

Were there any BHP guidelines, instructions, handouts, videos, anything of that type relating to mines safety that were made available to the mine?-- There was a safety policy and a mission statement that indicated the company's corporate views on safety.

Do you know if any other BHP mines have spontaneous combustion problems?-- At 7 August Moura No 2 Mine was the only BHP underground mine. Since then Crinum has become developed and it is now the only BHP underground mine.

Doesn't BHP have underground mines in New South Wales?-- They do, but I'm not conversant with them.

What I'm trying to get at is if an organisation as big as BHP doesn't have some central advice to individual mines with regard to training of personnel -----?-- I'm sorry, I can't answer the question. I do not know.

So what are you saying? It was left largely to the individual mine, in your case Moura, to design and implement your own schemes?-- Yes, we were based on statute. We followed statute and on a needs basis in line with the corporate

company policies.

In your time at Moura, apart from the audit that you've referred to, did you ever get a visit from people who were in the safety department of BHP or any directive or advice from headquarters relating to mines safety?-- I cannot recall any, no.

Can I take you to that incident of windblast which was sufficient to blow out stoppings, and I think as Mr Clair said that was presumably caused by a fairly large fall, a fall of significant magnitude in the 512 goaf?-- Yes.

Was this windblast anticipated - or this type of fall anticipated by the risk assessment?-- I think we did discuss it.

Was it quantified, the probability of such a fall occurring?-- I think it was discussed and I think to some extent it was either discarded or it ranked a very low rating.

Would you be aware if there was any pillar failure associated with a collapse?-- On that particular day?

Yes?-- I had no way of knowing that.

You had no way of knowing that. Would you have any way of knowing if the geological anomalies that we have seen in Exhibit 104 - I'm not necessarily referring you to that, but we have seen a geological plan which does show guttering in the roof - would you have any knowledge if it was possibly associated with those geological anomalies?-- I have no way of knowing that. One would have to go into the goaf and do a detailed examination of that. I wasn't going to go in the goaf.

Finally, Mr Barraclough, you've experience, considerable experience in the mining industry in senior positions in the industry, mine manager and superintendent; superintendent is a position senior to manager?-- In Collinsville it was a position sort of equivalent status to.

The position you occupied at Moura was a comparatively junior position to your previous jobs?-- That is correct.

Did you find the job at Moura sufficiently challenging and stimulating to maintain your interest?-- When I joined Moura in March 1992 my intention was to stay there for 12 months to gather sufficient finance in line with my future plans and then I would leave the industry. On being appointed safety training officer I found the job so challenging, interesting, I became so highly motivated that instead of staying there 12 months I finished up staying two and a half years - or is it three and a half? Well, I'm still here.

Thank you for that answer?-- I found the position very challenging and very interesting.

Thank you.

EXAMINATION:

MR ELLICOTT: Can the witness have Exhibit 40, please? This is the previously discussed extract of the spread sheet which provided training records; is that correct?-- Yes.

The column fourth from the right is entitled "Spon com, gases, dust"?-- Correct.

I think you've indicated in evidence that the entries corresponding to 16 June 1994 on that document are in fact a record of a mass safety meeting?-- Yes.

And the topic of that safety meeting was cable flashes?-- Cable flashes was one of the matters discussed at that safety meeting. It was not the sole topic for that meeting.

Can you tell me what other topics were discussed?-- We would discuss feedback from points raised from the floor at previous meetings. The mine manager would give detailed descriptions with the aid of overhead projector of significant incidents that had occurred not only at Moura, but throughout the industry.

Can you tell me if spon com was discussed?-- I do not recall that spon com was discussed, no.

Would you agree that this document may be confusing given that column heading and the dates of entries in terms of people believing that some people may have been trained in spon com?-- This document was my main data base. No-one else took any interest in the document. It was my tools of trade as such. When you say it is misleading, it would be misleading if this was a public document for people to read, but this was my main sort of data base and no-one else -----

Can I suggest that this has now become a public document and on the face of it may provide some confusion without that further explanation?-- Yeah. Could I please say -----

Certainly?-- As I've expressed to an earlier question, the full title of this issue that we are now discussing, 7.2.1.10, refers to mine gases, spontaneous combustion, dust and other ignition sources. On reflection I now believe that that section should be subdivided into those four headings.

Would you agree that if somebody whose name appeared in the left-hand column of that document was handed the document and it was suggested to them that they had been trained in issues related to spon com on 16 June, they may appear to become a little confused?-- Yes, yes.

Nothing further, thank you?-- Could I just say, please -----

Certainly?-- ----- in finality, that all these dates and

documentation that is here on this summary of training, all the details are held in files back at the mine.

My questions have been related to the face value of this document as presented and I value your explanation, thank you?-- Thank you.

FURTHER CROSS-EXAMINATION:

MR MORRISON: I just want to take you to a couple of things, Mr Barraclough, if I may. You were asked some questions by Mr MacSporran yesterday, I think - yes, yesterday, along the lines of when Mr Walker was visiting the only effectively practical way he could have found out about the supposed incidents about smell and so forth would be if some employee of the mine told him. Do you remember those questions?-- Yes, I do.

In fact you mentioned that Mr Walker was talking to Mr Robertson that day?-- Yes.

We know it was Mr Robertson who had the benzene smell?-- Yes.

On 24 June?-- Yes.

And he was also talking to Mr Bryon that day, the check inspector?-- Yes.

It was Mr Bryon who was involved in the incident on 22 July?-- Yes.

Do you know if he spoke to Mr Mason that day?-- I think Mr Mason was with us when we were having a pre-inspection discussion, yes.

The Mr Bryon that I've referred to is the same Mr Bryon who got the eight parts reading on 22 July?-- Yes.

The same Mr Bryon who was handed a graph of 18.98 litres on that day by Mr Abrahamse?-- Yes.

The same Mr Bryon who was taking shiftly readings on 24 and 26 just prior to this visit?-- Yes.

Now, you were asked some questions about the mine record book and your entries of 14.9 on 15 and 22 July?-- Yes.

Do you need that document back to look at it?-- No, no.

On that first day you answered Mr Harrison, I think, by saying that essentially the only data you had was whatever it was Cocky Morieson gave you?-- Yes.

On the second day, that's the 22nd - yes, that's right, the 22nd, the next Friday?-- Yes.

Six parts and 14.9 is recorded again; do you remember that? You perhaps do need the document?-- No, the 22nd is the day the eight parts appeared.

Yes, that's right, and in the mine record book your entry regards six parts and 14.9?-- No, that -----

You better have a look at it?-- On the 22nd I believe I put eight parts.

Have a look at the document anyway. If I remember it rightly it's page 25 - look, you are absolutely correct?-- Sorry?

You are absolutely correct. Your memory is much better than mine. It's probably the first concession I've made?-- Could you please repeat that a little louder?

No, I certainly won't, and I will deny I ever said it.

PROF ROXBOROUGH: It's on the record.

MR MORRISON: It's on the record, that's right. Eight parts and 14.9. That's the entry for 22 July. What time did you leave that day? Was that before the people had gone down and got their recheck figures?-- Is this the 22nd?

Yes?-- Yes, I left the mine at approximately 2.30 - two/2.30.

Was that entry put in the mine record book on the Friday?-- Yes, certainly before I left the mine, yes.

So at that stage you didn't have available to you the rechecked readings that the people got?-- No.

You didn't have available to you the recalculated CO make?-- That is correct.

So on that basis is it a fair inference that you simply took forward the 14.9 from the previous entry that you made?-- Yes.

And the reported reading of eight?-- The eight is what I had. It was the worst case scenario. That was the information I had, that's the information I wanted to know.

Now, you mentioned the electronic noticeboard in one of the answers and its positioning next to the start point and opposite seats where people sat waiting to go down?-- Correct.

Did you in fact use the noticeboard for various sorts of messages?-- Very regularly, probably consistently, permanently.

I think I understand, and were they messages that were safety directed or operational directed or what?-- Very rarely did we put anything on there other than safety messages.

Can I just ask you about the chief inspector's approved scheme for training? Can I ask you to have a look at this document, and I will open it at page 13. You will probably confirm for me that it is the chief inspector's approved scheme and page 13 where I've opened it is the section referring, amongst other things, to the heading that you've got in your Exhibit 40, the spread sheet?-- Yes.

Is that from where you took that heading?-- Yes.

So it just simply mirrors whatever the heading was that the chief inspector decided was the right way to word things?-- This document does not say it is a chief inspector's document. I understand it is, but it does not state that.

It doesn't say it on its face?-- But the spread sheets we have been looking at, the reference numbers and the titles I took from that page 13 of that document.

All right. I will tender that document and I will call it, until it's called otherwise, Chief Inspector's Approved Scheme of Training - 1991.

WARDEN: Exhibit 170.

ADMITTED AND MARKED "EXHIBIT 170"

MR MORRISON: I want you to look at this document in just a moment. The document I've just handed to you, is that the full spread sheet that you referred to earlier?-- That is a copy of my master data base spread sheet on which all training is recorded, yes.

And it's from that data that Exhibit 40 was extracted at the inspector's request?-- That is correct.

It's not as if you decided to produce Exhibit 40 just in reference to witnesses, you were told to do that?-- I was asked to do it. I cannot remember who asked, but I was asked to do it, yes.

Now, we know that the chief inspector's requirements - Part 59 requirements are for retraining every five years?-- Yes.

It must follow from that that one complies with the regulation if you achieve retraining once every five years?-- Yes.

Quite apart from questions of other standards that might be

imposed within a company or by a mine or someone else?-- Correct.

But the Statute is satisfied if you are retrained once every five years?-- Yes.

Is it possible then to get employees who transfer from mine to mine who may go longer than that?-- I suppose that is possible, yes.

Do you know of any requirement by the Inspectorate or under the Statute to track employees mine to mine, keep a tab on their training?-- I am not aware of anything like that, no.

Now, it seems then that under the Statute at least - there being no requirement to track people mine to mine - that under the Statute itself people could miss training and not be picked up?-- It is possible, yes.

I just want you to look at that a little further, please, and tell me, is there a column there - I think it's the third column over - which bears a heading "Fire Fight"?-- Yes, 7.2.1.1.

And its full designation at the top of the page, again taken from the approved scheme, is "Use of Firefighting Appliances"; is that right?-- That's correct.

Now, there are a huge number of entries down that column under that heading, aren't there?-- Yes, there are.

Look at the last one, please, and tell me if that's Mr Ziebell?-- Mr Ziebell, yes.

And the date recorded for him, 5 December 1990?-- 5 December 1990, yes.

I just want you to have a look at this document, please. It's Exhibit 39A. Now, we have heard from Mr Ziebell, he waiving all his rights to privacy?-- Sorry?

He waiving all his rights to privacy, that this is his exam sheet or exam form that was completed by him, and you notice it bears the date for that test?-- Yes, 5/12/90.

We also know from Mr Ziebell that the information that it was based on is Exhibit 39, the induction module?-- Yes.

Now, you know the induction module which you were shown yesterday or even today?-- Yes.

And it contains information and handouts about spontaneous combustion, doesn't it?-- Yes, it does.

And overhead projections and all sorts of information about spontaneous combustion?-- Correct.

On the face of it, would you agree that it appears Mr Ziebell

at least underwent a course and passed an exam which included questions on spontaneous combustion on 5 December 1990, albeit that it's recorded under a heading of "Fire Fight" in the spread sheet?-- From what I can gather briefly looking at this document, questions 4, 10, 16 relate specifically to spontaneous combustion.

Could the witness see Exhibit 39? I think if you check through the module, which you have been shown before, you will see the exam paper is in fact in that module, the very one that Mr Ziebell sat for?-- Yes, that is correct.

The documents I have shown you then, would you agree they demonstrate at least Mr Ziebell underwent that course in 1990 which included information on and training on spontaneous combustion and sat for an exam which included questions on that topic?-- That is correct.

If you look down that list that I have showed you on the major spread sheet, there are in fact a lot of people who have their data entries for 1991 and 1990 under that column, aren't there?-- There are a lot. I would say that it appears to be certainly in excess of 90 per cent of the people.

Let me just show you a couple of other exam papers and you might be able to tell me that they are in fact the same exam paper reflective of having gone through the same course, one for Mr Tuffs and one for Mr Morieson; is that right?-- That is correct. Different dates but certainly Mr Tuffs and Mr Morieson, yes.

And dates for Mr Tuffs?-- Mr Tuffs, 21 August 1990.

Mr Morieson?-- 14 August 1991.

It's apparent they underwent the same course?-- The assessment sheet is exactly the same, yes.

You can hand those two back, I don't need them any more. Those two gentlemen don't appear in your column for "Fire Fight", do they, as having - with corresponding dates to the ones you have just read out?-- Mr Tuffs' name appears on the Fire Fight on 18 May '94.

So, he has got an updated date from 21 August 1990?-- Yes.

And Mr Morieson?-- Mr Morieson under "Fire Fight" as 29 June '94.

So, he has got another updated date from 14 August 1991?-- Correct.

I will tender both of those theory assessment sheets together; theory assessment sheets for Mr Tuffs dated 21 August 1990 and Mr Morieson dated 14 August 1991.

WARDEN: Admitted and marked Exhibit 171.

ADMITTED AND MARKED "EXHIBIT 171"

MR MORRISON: Now, they are not the only theory assessment sheets, are they? There are hundreds of them in the personnel files?-- Yes.

If we went through all the personnel files - I have only got half a dozen here, and I am not even going to go through those extra half dozen - but if we went through them all and found that a significant number of people underwent that module in Exhibit 39 and sat for the exam on dates reflected in that spread sheet, we could be fairly well satisfied that those people had undergone a course where spontaneous combustion was a topic and on which they received training and sat for an exam where they were asked questions about that topic?-- That is correct.

Tell me, would you class that as refresher training?-- Yes, I would.

And even though it doesn't appear under the column 7.2.1.10, nonetheless it is refresher training covering spontaneous combustion, isn't it?-- Yes.

Now, all of those dates, that's '91 and '90, are before your time, aren't they?-- They are.

And Mr Danvers was the predecessor to you, wasn't he?-- Yes.

Now, can I just ask you to look at this bundle of documents, and in particular the one on the front? You were asked, I think, by Professor Roxborough whether Mr Morieson had received any qualifications for his position. Is that the personnel file for Mr Morieson?-- This appears to be the personnel file for Mr Morieson which is kept in my office along with all other personnel files, yes.

And the document on the front, is that a copy of the certificate which he obtained in relation to being a fire officer?-- That is correct.

I tender that certificate, a copy of it.

WARDEN: Exhibit 172.

ADMITTED AND MARKED "EXHIBIT 172"

MR MORRISON: Can you just read into the record the date and the place from which it was obtained?-- "Mines Rescue Service, New South Wales; Proficiency Certificate; Allan Morieson; Course Title: Colliery Fire Officer; Duration of Instruction: five days; Date Issued: 29 May 1992;

Certificate Number 3147."

I think that will do. I think that's enough detail. I will also tender - I will have back the personnel file. I will slow down. While that's being marked, I might just hand that back to you and - no, I won't, I will have to wait. You might remember, since you have just read it, that the subjects covered as revealed in the certificate include ventilation?-- Yes.

I will tender also the large spread sheet.

WARDEN: The spread sheet will be Exhibit 173.

ADMITTED AND MARKED "EXHIBIT 173"

MR MORRISON: I am just going to ask you to look at a document to help you remember some questions Mr Martin was asking you about, and I am showing you a copy of Exhibit 152 but with some highlighting on it that I have just put on it. You can accept that it's a copy of 152?-- Correct.

I am not going to mark the exhibit with my own highlighting. Mr Martin asked you to direct your attention to readings taken, that is, Drager readings taken by Robertson, Bentham, Newton and Robertson again, in that order, and I have highlighted them. The first was 26 July, a reading of 5?-- Yes.

The second was 27 July, a reading of 3?-- Yes.

The third was 28 July, a reading of 8?-- Yes.

And the fourth was 28 July, a reading of 5, the next succeeding one?-- Correct.

Now, Mr Martin asked you how would you explain that, the readings are all over the place, and you mentioned that you would want to know the Maihak readings at the same time?-- Yes.

Well, you can see the Maihak readings there for those entries and around those entries, and I think I am correct in paraphrasing them as all being high 5's to low 6's?-- Yes.

Well, seeing that, does that assist you to deal with those readings that Mr Martin directed your attention to?-- What I deduced from this is that there seems to be some anomaly in the 8 and the 3 and the 5, certainly in discrepancy with the Maihak, because in most cases the Maihak is higher with the exception of the 8 on the Drager by Newton, but consistently before, during and after that period of time the Maihak is in the region of 6, 5.8, 5.7, 6, 6.4, 6.2.

So, if you went and investigated those readings and discovered

that and no more, you might draw the conclusion that the readings of 3 and 8 were anomalous?-- That is correct.

Well, particularly if you were told that on the reading of 3, as we know from the exhibits in this Inquiry, on that day the Unor never dipped below 5.4 at any stage and yet this reading of 3 comes up, so it's out of sync entirely, isn't it?-- Completely.

If you accept what I have just put to you?-- Completely.

And likewise, the next reading, which was Mr Newton's 8, as we know from the exhibits on that day, there was no reading of 8 on the Unor and it never got higher than 6.5 on the whole day?-- That is correct.

And also if you know that on the 28th when Mr Newton got his 8 that there was a regulator open in 5 South, that would affect the question of how you assessed the reading of 8 parts?-- Yes.

We know that from the underground shift report for that day, 28 July 1994, the night shift underground shift report by Mr Sim which shows 5 South regulator opened up for 5 South. Perhaps you just better confirm that for me in the part which I have highlighted for you on that report. Is that correct? I have highlighted it in yellow?-- Yes, I can barely read it, but that's what it says, "regulator opened up".

I tender that underground shift report for 28 July 1994.

WARDEN: Exhibit 174.

ADMITTED AND MARKED "EXHIBIT 174"

MR MORRISON: You can hand back to me the copy of Exhibit 152. Can I ask you this: you mentioned that on the 18th when you travelled down the top return with Mr Bryon and then across the back of the panel that you detected the chemical roof bolt smell but it decreased and was gone by the time you were in 13 cross-cut?-- That is correct.

When you came back out, was the chemical roof bolt smell still there?-- No, no, it had gone.

So, any chance of masking anything had ceased. You were asked by Mr Clair could it have masked anything else?-- That is correct. Having gone down and detected the chemical smell, as we got further in it got less and less and as we came back out it had disappeared altogether, and I assumed that the ventilation current had taken away the smell that had occurred, and I certainly did not detect any other smell.

Now, you were asked by Mr Clair, on a different topic, whether it would be a good idea for the future to have - not what he

called it, but what I might term a log of significant incidents in relation to either a panel or the mine generally?-- Yes.

Part of his question was directed to whether computers might aid that and that that might be useful for, amongst others, inspectors if they came to the mine, they could check that out?-- Yes.

But it always relies upon people performing their duty, doesn't it, and doing their job?-- And the input into the computer.

Yes?-- Yes, of course it does.

If inspectors don't bother to read the mine record book when they visit the mine, do you have any anticipation they are going to read this one unless they are told to?-- Well, I don't know. If the inspectors are not showing much interest in reading the record book, probably they are not going to show much interest in reading any further development of the record book.

And it's the same with - that problem attends - I don't mean to say this problem would defeat any efforts to improve reporting, but inevitably whatever formal document you produce, be it computer aided or be it more informative or quantitative or qualitative or anything else, it is always going to rely upon the human element to input the data?-- Correct.

Now, you were asked by Mr Parkin to comment upon, amongst other things, your reaction to a Graham's Ratio of .5 combined with a methane reading of 3 per cent. Do you recall that question?-- Yes.

Now, as I understood the question being put to you, it was premised on the basis that it was 12 hours before the incident but pre-sealing; do you recall that?-- Yes.

Now, in fact, those figures only occur certainly 12 hours before the incident but well after sealing; not before sealing, well after. Now, if you know that it is a figure - that is a Graham's Ratio figure - being derived from inside a sealed panel, does that affect the way you would approach it?-- I'm sorry, when Mr Parkin asked me the question, I believe I returned a question by saying - asking: "Are you referring to pre or post-sealing?"

Yes, and I think he told you pre-sealing. If it was post-sealing? If those figures are post-sealing?-- If those figures are post-sealing?

Yes, if they are post-sealing?-- If those figures are post sealing, they take on a whole different meaning.

Well, I seem to remember you saying earlier in evidence - yesterday, it may have been - that the Graham's Ratio loses it's value after a sealing?-- That's as I understand it, yes.

I want you to look at a couple of documents so we can understand this - these two graphs. These are the graphs out of the SIMTARS material. Could you tell us what the first one depicts, please - by its heading?-- The first one is point 5, 512 seals.

And does it depict in graph form by a green line the Graham's Ratio?-- Yes, it does.

And is the vertical axis for that, I think, on the right-hand side?-- Yes.

Tell me as you look at that, does it cover the period that we are discussing immediately before and after the sealing and up to the explosion?-- Could you please refresh me the time of the - the seal.

The seal is about half past 1 Sunday morning, the 7th. I'm saying does it encompass that time period?-- Yes.

Now, at any time before or during the seal operation, which concludes at half past 1 Sunday morning, does the Graham's ever get to 0.5 on that graph?-- No, never.

And does it only do that right at the explosion time, or even then, maybe it doesn't?-- Probably at the explosion time it suddenly jumps from 1 to 5 - as a vertical line.

But certainly right up to the explosion time, so far as that graph reveals, the Graham's never got to 0.5?-- No, never.

And look at the second document, please? Is that the similar graph for point 16 over the same time-frame?-- Point 16, 512 top return.

Does that also show, in terms of the delineation of the Graham's Ratio, that it, likewise, didn't get to 0.5?-- Yes, on this one the Graham's Ratio is shown in red and at no time did it exceed 0.3.

I will tender those two documents as a separate exhibit.

WARDEN: Exhibit 175 and 176 as referred to by the witness.

ADMITTED AND MARKED "EXHIBIT 175"

ADMITTED AND MARKED "EXHIBIT 176"

MR MORRISON: I just want you to look at volume 2 of the SIMTARS material open at appendix 5.9(A) page 4 of 6. Now, do you see on that page where I have opened it for you that there is a column which deals with the Graham's Ratio?-- Yes.

And also a column that deals with the methane?-- Correct.

And if we go down the methane column to the first time it reaches 3-----?-- Sorry, there are two methane columns: a CH4 column and a CH4 corrected.

You can take either?-- Okay.

Take the - just the CH4 column. Go down to where it first reaches 3?-- Right.

And tell me what's the time when it first does that - time and date?-- The date is the 7th, 12.47.

That's 12.47 lunchtime?-- 12.47 - it doesn't say a.m. or p.m., so I assume it is a 24 hour clock.

Yes, 24 hour clock. It is the middle of the day?-- Right.

That is 12 hours prior to the incident - that is, the explosion?-- Yes.

Certainly post-sealing?-- Yes.

You can hand that document back. Now, you were asked by His Worship to look at a number of volumes here. Do you recall looking at those books?-- Yes, I do.

You were asked whether you had seen them or - basically I think you were asked whether you had seen them. Now, are sum of these post the event - post-August 1994, can you recall? I only ask because the first one is the 1995-----?-- Sorry, I was asked if I had seen them, and my reply was no, except for one.

Okay. Well, have them back for the moment. Just go to the last one. The last one in the pile?-- Could I please have some assistance with this, Mr Windridge, in that this one I said I had never seen before; on reflection, I have seen

probably the 1994 version of that.

WARDEN: Thank you.

MR MORRISON: Thank you for that. Can you go to the last one? Did you, in fact, have some role in the development of that volume?-- Yes, I did.

Just explain to me how?-- Within the industry over the last few years there has been a thrust whereby the industry has been indicating it wanted to have more input and probably regulation into education within the industry - that is, education for deputies, undermanagers, managers. The thrust came in a tripartite arrangement where union's members - members of company management and representatives from government bodies got together to start and write - or arrange or organise for education material or training material to be written under their own auspices.

Were you asked to participate in that-----?-- I attended one or two meetings as a representative of BHP management on that body, yes.

And can you just make sure we understand the volume you are talking about is-----?-- This is entitled, "Basic Ventilation Practice, Student Notes", reference number NCM030.

What I wouldn't mind, Your Worship, if it isn't going to deplete the libraries of some particular area, is to tender the whole bundle, because I want to make reference to it some other time.

WARDEN: Thank you. As one bundle, Exhibit 177.

ADMITTED AND MARKED "EXHIBIT 177"

MR MORRISON: Lastly, though - this doesn't require the witness - can I just mention that Mr Ellicott was asking questions about the June safety meeting. The minutes are Exhibit 78. That's all I have, Your Worship.

FURTHER EXAMINATION:

MR PARKIN: Mr Barraclough, I think the transcript should show or indicate that when I asked you the question, I mentioned practically 12 hours before the incident and the incident being the explosion. It is obvious to everyone at this Inquiry that the Graham's Ratio didn't get anywhere near 0.5 before the sealing. We all know that. Now, I've got two graphs here. Can the witness be shown these, and I will have to get copies for the other people later. If I did mislead

you, I certainly apologise for that. It was not intended. The question I asked you was practically 12 hours before the incident, which is the explosion - and if you look at the first graph and look at the Graham's Ratio, you will see, and you might read off and tell us what it indicates 12 hours before the incident, which I said previously - what does it read, approximately?-- 12 hours - 0.2.

No, you are not reading it correctly. Are you looking at the right graph?-- This is the 7th of the 8th?

The Graham's Ratio?-- The Graham's, yes.

What does it read at 12 hours before the explosion?-- Would that be 12 noon?

Yes?-- 12 noon it is reading - the word "Graham" has covered up the scale, so I have got to - oh, probably slightly under 0.5.

Yeah, well, if you do get a ruler and you put it across there, you will find it is in excess of 0.5?-- Sorry, partly under 0.6.

Partly under 0.6. Okay. Now we have established clearly that approximately 12 hours before the explosion the Graham's Ratio was in excess of 0.5?-- Yes.

Now, can we look at the second graph on CH4?-- Yes.

And tell me again for the same time period what you are reading of CH4?-- Approximately 3 per cent.

Now, can I repeat the question? It is a sealed area. If you had have been aware of those readings 12 hours before the explosion, what would your actions have been?-- I would have caused other personnel external to the mine to be involved. I would have called in expertise from the rescue station, use of a gas chromatograph and whatever other resources were available to me.

Would you have allowed men underground on that night shift?-- Based on that information, no, I wouldn't have.

Thank you, very much. And I would like to apologise to Mr Morrison if in any way - or the Inquiry - if I misled them in any way at all, because it certainly was not intended, as proved by the two graphs that you just read off, Mr Barraclough. Thank you very much.

FURTHER RE-EXAMINATION:

MR CLAIR: Just so that we can be a bit more accurate about those figures, could the witness see that volume 2 of the appendices to the SIMTARS report at 5.9? Appendix 5.9(A) is the one I would like you to go to. Now, that's 5.9(A) at page 3 of 6. You will see from the heading there that this is a tabular form of the various readings of the 512 seals - gas ratios?-- Yes, I see that.

And there is a column there dealing with the Graham's Ratio?-- Yes.

Being the fourth one from the right-hand side?-- Yes.

And the time is, in fact, set out in the column over on the left-hand side?-- Correct.

The first time appearing on that page is 23.03 on the 6th?-- Yes, that is correct.

And you move into the 7th. The best way to approach this is to isolate the point at which the Graham's Ratio passes through the 0.5 barrier which is the third line-up from the bottom?-- Yes.

That was at 8.56 in the morning?-- That is correct.

And in fact it then remains above that level, if you go right down the next page, it passes above .6 at 13 minutes past one the next day, that's about two thirds of the way down the page; is that right?-- Yes, yes.

And then remains above .6 right through the afternoon until it reaches a peak of .82 about half-way down the next page at 2322, that was 22 minutes past 11?-- Yes, I'm with you.

On the 7th?-- Yes.

That might just more accurately reflect the progression of that than by looking at the graph?-- Yes.

But I take it that wouldn't alter the answer that you gave to Mr Parkin?-- No.

You would certainly be so concerned as to be carrying out whatever investigations you could?-- That is correct.

Even though those figures are occurring in a sealed panel?-- Yes.

Thank you. Thank you, Your Worship.

WARDEN: Do you want to put these graphs in through him?

MR CLAIR: Yes, I think Mr Parkin showed you some graphs there. I don't think they have been tendered as yet. Just have a look at those two sheets again. It may be wise to have those tendered as an exhibit. I will tender those, Your Worship.

WARDEN: Exhibit 178.

ADMITTED AND MARKED "EXHIBIT 178"

MR CLAIR: I have no further questions of Mr Barraclough, Your Honour.

WARDEN: Thank you, Mr Barraclough. I apologise for the extended session. In the interests of trying to get it finished I allowed it to go on a bit overtime. You may stand down. You may leave. I hope you forgive us?-- Thank you.

Can we please adjourn? We will resume at 2.30.

THE COURT ADJOURNED AT 1.17 P.M. UNTIL 2.30 P.M.

THE COURT RESUMED AT 2.36 P.M.

MR CLAIR: May it please Your Worship, I call Michael Andrew Squires.

MICHAEL ANDREW SQUIRES, SWORN AND EXAMINED:

MR CLAIR: Your full name is Michael Andrew Squires; is that correct?-- That's correct.

Mr Squires, if you just sit in a relaxed way on the chair, you will find your voice still travels through the microphone. You don't need to lean forward and speak into it. You are in the position of shift undermanager at the BHP Australia Coal Mine at Moura No 2?-- That's right.

And in terms of your history in the industry, you started as a Queensland Coal Owners Association Cadet Manager in 1981; is that right?-- That's right.

You were working then at New Hope Collieries at Ipswich?-- That's right.

You completed a three year cadetship and then you were appointed as a technical assistant at Moura No 2 Mine in 1984?-- That's right.

You obtained your Second Class Certificate in 1987?-- That's right.

And, in fact, you were appointed as an undermanager that year?-- That's correct.

You have stayed in that position until now; is that so?-- That's right.

While I am asking you these questions, perhaps if Exhibit 12 could be shown to the witness, Your Worship? At one point there was a document compiled which was a position description form in relation to that position of shift undermanager. If you have a look at that document and go 10 pages from the back you will find the relevant part. Do you have that? Perhaps if I can have the document and I'll find it for you. That page is headed "Position Description, Undermanager"; do you see that?-- Yes, I see that.

And that's a document that sets out various items, including the responsibilities attached to the position of undermanager, and before we look at the detail of the document, if you go over two pages, you will see there a list of names and some signatures, one of which is yours; is that right?-- That's correct, yes.

And that was signed by you on 20 January 1994 by way of an acknowledgement that you have read and understood the contents of your position description; is that so?-- That's right.

Just briefly I want to take you to the responsibilities attached to the position. I don't want to go through every one of them, but I'll pick up a few on the way through. The first one is described in part this way: "To be proactive in all aspects of safety management at the underground operation." It goes on to talk about making recommendations "to prevent recurrence of accidents and incidents" and also to "effective implementation of the Moura mine Occupational Health and Safety Policy". Now, that was a policy of which you were aware?-- I can't remember much of the documentation of the Health and Safety Policy, but I was aware that the - part of the ongoing safety awareness of the mine was the fact that undermanagers were doing accident investigations and reporting and things like that.

Can I take you to No 3, which speaks of "a responsibility to coordinate all the activities of the underground mine, including production of underground coal, methane gas drainage, housekeeping and other general outbye activities of the underground operation on a shift by shift basis." Do you see that one?-- Yes.

The next one is "a responsibility to communicate effectively with on-coming shift undermanager so that efficient shift changes can occur."?-- Yes.

Over the page, No 5, "to monitor all production sections and collate all pertinent information so as to compile the shift report."?-- Yes, I see that.

And just pausing there, you are no doubt aware of the shift report that had to be filled out by the undermanager at the end of each shift; is that so?-- Yes.

And then No 12 there refers to "a responsibility to develop a high level of communication and interpersonal skills with all other members of the operation." No doubt all of those items of responsibility of an undermanager were items that were emphasised with you at the time that you signed this document?-- Yes.

Well, just put that to one side, if you would, for the moment. In terms of your history, you joined Mines Rescue in 1984 and you have remained a member of that organisation?-- That's correct.

You have made a statement in relation to this matter, a statement dated 17 August 1994, partly as a statement and partly by way of a response to interview questions asked by one or other of the inspectors there; is that right?-- That's correct.

And that statement - you have a copy of that in front of you?-- Yes, I have.

It has "DOC 70/17" in the top right-hand corner?-- That's correct.

That statement is all true and correct?-- As far as I know, yes, sir.

Well, to the best of your ability?-- To the best of my ability it is.

During the past two years, that is up till the date of your statement in August of last year, had you been a shift undermanager working a day shift/afternoon shift rotation?-- That's correct.

Did you do that with one particular crew?-- Yes, previous to that I was with the same crew, but we were on three shift rotation.

Right. Now, you do mention in your statement various areas that you regarded as your responsibilities. These are perhaps put in shorter form, but cover some of the same areas that are in your position description statement. You mention there the safe running of the mine?-- Yes.

Is that right? Compliance with the Coal Mining Act?-- Yes.

And the production requirements as planned by management?-- That's correct.

Did you intend to give more weight to any one of those as opposed to the others, do you think, in your day-to-day operations?-- The emphasis that the company was putting on the undermanagers was that safety was to take a high priority in our overall outlook on the mine.

Did you see yourself as having any specific responsibilities in terms of the compliance - or compliance with the Coal Mining Act? Were there particular areas of that that you saw as falling within the scope of the duties of undermanager, or was it - was that a general responsibility - that is, to keep an eye on all aspects of compliance?-- I think it is just general supervision of the compliance overall in the mine.

You have mentioned also production requirements as planned by the management. Were these matters which weighed heavily in terms of your performance from shift to shift? Was the amount of production something that you regarded as important?-- Not so much the amount of production, so much as the actual running or the producing of the mine, if you understand what I mean. Not so much worried about the amount of coal you are producing, so much as just the actual physical working of the sections and how they were going and how the blokes were going.

Was there a mood in the place, though, whereby it was regarded as a good thing to have a higher production on one shift than, say, on another? That fellows, when they came up at the end of their shift, go and check the weightometer to see-----?-- Yeah, I think it was an occurrence that happened on every

shift but there was only a few blokes that did it. Most went and had a shower.

Was there a bit of discussion with the shift undermanager as to whether it is was a good shift or bad shift?-- Sometimes guys would ring before the end of the shift and ask how many tonnes were up, and things like that.

Now, you report directly to George Mason, the undermanager in charge-----?-- That's correct.

-----within the structure. Now, you had as a duty from shift to shift the obligation to inspect all places where men were working, and to be familiar with the overall operations - that's in the working panels and also in terms of what the outbye deputy might be doing and in terms of what was happening?-- In the overall operations in where they were producing, what outbye work was being carried out, that sort of thing, yes.

Yes. Well, it is not as though you were particularly focused just on the workings in the production panels. You had a responsibility across the board?-- That's correct, yes.

As part of your duties, you have already accepted that it was necessary to fill out a shift report. Did you receive any instruction at any time as to how you should fill out your shift report?-- When I got my undermanager's ticket I was off-siding a shift undermanager by the name of Bob Suddle and he sort of - I picked up things off him on the way and he showed me how to fill out a shift report.

What did he tell you? He told you to summarise what he told you?-- Sure, basically he said the most important thing with the section is at the top state whereabouts the continuous miner was working, the location, during the shift to note the down-time and any other difficulties they might have had there, and at the end of the paragraph of the section to put down where they ended up finishing, plus the - obviously the tonnage meter before and after the shift.

The sorry - what before and after - the tonnage meter?-- The tonnage meter.

So, your shift report indicated how much had been produced during the shift?-- That's correct.

And apart from that, what else were you to put into your shift report?-- Just any outbye work - if you had teams of fellows working outbye, you would just put down where they were - you know, what they were working on.

Now, I did refer to one responsibility - No 5 in your position description - as being "to monitor all production sections and collate all pertinent information so as to compile a shift report." Now, what about events then within production sections - things that might be reported, for instance, by the deputy on a shift to have occurred during the shift? Would that be regarded as pertinent information?-- I'm not quite

sure what you mean. Could you give an example?

If there was some significant change in ventilation, for instance, or if there was some problem with ventilation reported, if there was something unusual that was reported in the panel that indicated the possible existence of some danger?-- Right.

That sort of thing - things that are relevant to safety of the men, things that are relevant to the continued operation of the panel, that sort of thing would be pertinent; isn't that so?-- Yeah, I suppose so, yeah.

You would more than suppose so it would be pertinent information, wouldn't it?-- Yes, I'm just trying to relate to how, for example, an undermanager would do it or how he was suppose to do it. I'm just trying to get that clear in my mind, that's all.

If we were to be guided by this number 5 item in the responsibilities then the way that he would do it would be to put it into his shift report; isn't that so?-- Yes, I suppose a shift report would be the best place to put it, yes.

Because that provides that an undermanager is to collate all pertinent information so as to compile the shift report?-- Yes.

What sort of instructions were you given along those lines -----?-- None.

----- in terms of filling out your shift reports?-- The only instructions I ever received about filling out a shift report was what I received in 1987.

From the -----?-- Bob Suddle.

The chap, your off-sider. It's not an unusual thing for a deputy to ring an undermanager and say, "Look, we have got a problem with re-circulation in the No 2 roadway.", or, "There is a problem with ventilation in the top back corner and we have had to change some of the stoppings." That's not an unusual thing, is it?-- Well, it's not a common thing. It occurs where a deputy might ring up and say, "I haven't got enough air.", or something like that, and you would have to authorise for a ventilation change or a modification.

So given that that sort of thing is at least something that would happen from time to time on a shift, wouldn't that be pertinent information?-- Yes.

Even more so then things that indicate danger in the panel?-- Yes.

That might indicate, for instance, the existence of a heating. That would be pertinent information?-- Yes.

What I'm asking you really is apart from what is here in your position description statement, has there ever been any direction to you or any training that you've received that indicated to you that you should put that sort of information into your shift report?-- Can I just get it clear? You are asking whether anyone trained me to put that sort of information in my shift report or told me to put it in my report?

Yes?-- No.

Did it occur to you at any time that that's the sort of thing that should go into a shift report?-- I didn't really think about it - in hindsight I would say that would be the sort of thing you would put in a shift report.

Where did you understand your shift report to go after you filled it out?-- The shift report stays in the book and it's read by the oncoming undermanager.

As a matter of practice was there anybody else who came and read the undermanagers' shift reports as far as you were aware?-- Yeah, George Mason read it. I know the production clerk would come around and take a copy out of it for his figures for machine availability and that sort of thing, and very occasionally some deps might - well, I had one dep on my shift who used to come around and have a look at it very quickly just to see -----

Of course, in a sense that shift report would have been the principal source of information for the undermanager-in-charge, I suppose, to see what was going on?-- I'd say so, yes.

You mentioned that it would be read by the oncoming shift undermanager?-- Mmm.

Of course, it would be important for the oncoming shift undermanager just as it would be for the undermanager-in-charge to know of all of the significant events that have occurred within, particularly within the working panels; isn't that so?-- That's right.

The underground shift report would be the principal source of information then for him to find out about any significant matters that had been going on in the operating panels?-- I found the principal source of information whenever I come on was actually the changeover, face-on-face talking with the undermanager on the previous shift. The shift report, usually when you come in with a hot seat change, was not complete because of the fact the crew still hadn't come up and hadn't got the last information. So I got most of my information off just the undermanager who was on previous and I would get a piece of paper - or he would give me a piece of paper and I would put it on me particular sheet and write the necessary information on it.

Well, that would work if there was invariably an overlap or would work to some extent at least if there was invariably an overlap between undermanagers?-- Yes.

But that wasn't always the case, was it?-- It's the case during the week, but on the weekends there is no overlap, that's correct.

No overlap and the undermanager who came in at the end of a Friday generally wouldn't speak with the undermanager going out?-- No.

So he would be -----?-- Beg your pardon, did you say the undermanager coming in on a Friday?

Yes, Friday for the - at the end of the Friday?-- An undermanager coming in Saturday wouldn't talk to the - yes,

that's correct.

Coming in on the Saturday?-- Wouldn't see the undermanager

To do the weekend shift I suppose is what I'm talking about?-- Yes.

If there was any significant event that occurred, if we were to rely on the word of mouth that occurs by way of overlapping undermanagers the chain would be broken?-- That's correct.

On the weekend?-- That's right.

So that really indicates that the efficient and effective way to pass on this information is to put it into the shift report?-- That would be the most efficient way, yes.

And in fact one of the responsibilities that's mentioned here is to communicate effectively with the oncoming shift undermanager. Now, the way to effectively communicate with the oncoming shift undermanager, so there can be no misunderstanding and so there is a record of it, is again to put something in the shift report; isn't that right?-- Up to the time he comes in, that's correct.

What was your practice as far as deputies' reports were concerned?-- The deputies would at the end of the shift hand the reports into the undermanager's office. The undermanager would read the reports. The official thing to do was the undermanager would read the report, sign the report and put it up on the noticeboard.

Now, the undermanager who would receive the report would be the undermanager who has been on the same shift as the report relates to; is that so?-- Not necessarily. It depends on - because you had an overlap of over an hour sometimes with undermanagers, sometimes you would get the undermanager on, for example, if the deputy's coming up from day shift it might be the afternoon shift undermanager that takes the report or it could be the day shift undermanager. Principally or normally it was the undermanager on shift who would receive the deputies' reports.

And not the undermanager on the next shift?-- No, it did occur, but principally it was the one on shift.

I want to move to another area of your history there. Did you receive any training after you commenced at Moura in respect of the recognition of spontaneous combustion and how it was to be dealt with?-- The only training I've received would have been from my induction in Mines Rescue in '84. I can't really remember exactly what we did in the induction, but I haven't received anything since.

What was the nature of that training first of all? We will come to the content in a moment, but what was the nature of the training at the time of your induction?-- The nature of the training was to gain competence with the Mines Rescue

procedures and the Mines Rescue Drager proceedings to become a Mines Rescue member.

That was to become a Mines Rescue member? Are you saying that was your induction training or was that your Mines Rescue training?-- That's my Mines Rescue training.

You mentioned induction training?-- No, I didn't get any induction training.

There was no induction training when you started at Moura?-- No.

I understood you to refer to induction training?-- No, sorry, no.

Did you receive any induction training when you started at Moura?-- No, I don't think that was in fashion at the time.

You started there as a technical assistant; is that right?-- That's correct.

At that stage you had had three years working as a cadet manager; is that so?-- That's correct.

And when you started at Moura then there was no form of training at all?-- No.

So to come to my question then about spontaneous combustion, what you are saying is you learned about that in your Mines Rescue training in '84?-- Yeah, I learned about spontaneous combustion in my - in two areas; whatever they taught us about it in Mines Rescue training in 1984 and there would have been some mining course within my cadetship between '81 and '83 that would have had something like that.

Combining both of those sources of training and whatever else you might have just learned incidentally over time, going back to when you were working as an undermanager in the middle of last year at Moura No 2, what was the extent of your knowledge about spontaneous combustion? What did you believe were first of all the signs that would enable you to recognise the possibility of spontaneous combustion?-- Signs for spontaneous combustion would have been a rapid increase in carbon monoxide. Like an exponential increase in carbon monoxide.

Pause a moment. When you refer to carbon monoxide, do you mean measurement in terms of parts per million -----?-- Parts per million.

----- or the actual rate of production?-- No.

That is the CO make?-- No, parts per million I was referring to.

Go on. What other features?-- I was a technical assistant during the 1986 spon com on 5 North West section. I wasn't there on site whilst they were sealing off, but I had to take

some tube samples and that sort of thing over to Rocky, and the next day the acting manager picked me up and took me out and I had to collate some material, information, and so he gave me a brief rundown on just what happened and how the CO - because I was technical assistant at the time I was aware of the fact that the CO had been slowly creeping up, and then one morning the shift undermanager on Saturday reported it had gone from 13 up to something like 23, and so that indicated they had some sort of problem, and then it shot up 40, 80, and so that was - to me that's the indications that you get with a spon com starting.

Talking about parts per million?-- Parts per million, that's correct.

Apart from the CO in parts per million what other signs were you told to look for to recognise spon com?-- I remember David Kerr said - no, that's not right, that's hindsight knowledge. In Mines Rescue we were told that you had - you get sweating on the roof from the humidity, and I'm not sure whether I knew before or after the incident, but I've heard about like a haze on the roof, but I think I might be getting confused - I looked at some information on that 5 North after the incident.

I'm trying to find out -----?-- What I knew before -----

Prior to the incident on 7 August?-- To summarise my knowledge of spon com, that's what I would be looking for, primarily the exponential increase in CO. Obviously as the heat goes up you would surmise you get smoke and various other things like that.

What about the existence of a smell? Was that ever mentioned to you?-- Well, it goes hand in hand that you get a tarry smell, that's correct.

You were told that in the course of your training, that a smell is one of the signs, or were you not?-- I would imagine so, yeah.

You would imagine so?-- Well, it would be in the text.

What was the form of the training with the Mines Rescue service? Were you given any literature on it?-- Yeah, we were given a book. Mackenzie-Wood and Strang, I think it was.

Did you read that?-- We would have read it - as part of the competition stuff you read it. We would have read it as part of our induction, and also whenever you go to a competition you would read up because they have written exams. I went to a comp in '85, and '87, I think, was the last one I went to.

Any other literature that you were given apart from Mackenzie-Wood and Strang?-- As a cadet I think we received a little blue book or something, that was it.

Did you ever receive a red book -----?-- No.

----- of similar proportions? Well, let me try to summarise your knowledge before 7 August: you say you would look for an exponential rise, you've called it, in CO - I won't try to examine at this stage what that means -that you would certainly be conscious of a smell as being significant in terms of a sign; is that right?-- Yes.

A haze, you mention that you would get a haze?-- Yes.

As indicating that there could be some spontaneous combustion and you've also mentioned that you might expect some sweating. I think you said on the roof?-- Yeah.

And on the ribs too?-- I've never actually seen what sweating looks like so -----

Okay. Did anybody ever describe for you the kind of smell that you might expect?-- I would - I just imagine a smell like the gob smell we got when you drive past the mine, because where the old No 1 colliery was it was burning underground. If anyone drove from Moura to Bilo you would always smell it.

If you had to describe that smell to somebody who didn't know what No 1 mine smelled like or hadn't been there, how would you describe that?-- Like when they lay bitumen, tarish.

A tarish smell?-- Yes.

Have you ever heard it referred to as a benzene smell?-- I've heard - I haven't heard of a heating or that sort of thing referred to as benzene. I've heard of people using the benzene thing, but I'm not familiar with what benzene smells like.

You said that you would be looking for an increase in CO in parts per million; did anybody ever talk to you at any stage about the significance of the CO make? I'm thinking now not so much at the time of your initial training, but towards the end of the 80s, the latter part of the 80s?-- In '87, being a technical assistant I found out what the formula was to work out CO make in litres per minute and I also had the understanding that CO make was the more modern way of expressing CO from an extraction section, if you like.

A more modern way of expressing the CO in parts per million?-- Yeah, what it does is it takes into consideration ventilation change.

It's more sophisticated than simply looking at the CO in parts per million, isn't it? Is that right? I know you are nodding your head, it's just that this lady can't take down a nod?-- That's correct.

Because it in fact gives you something which indicates the rate of production of CO?-- Yeah, it's measured in litres a minute, yeah.

Given that ventilation, that is the quantity of air that may

be given, or the wind velocity at the point where the reading is taken may be different from time to time to calculate the CO make gives you a better guide to what is going on?-- Yes.

Isn't that so? Now, you said that you learned the formula to calculate CO make somewhere around 1987?-- That's right.

Under what circumstances?-- I don't know. Someone - I think

someone just gave me a sheet of paper. I don't know where I got it from.

At the mine or somewhere else?-- No, I think it was at the mine. It might have been Dave Kerr. I really don't know where I got it. It was just a photocopied sheet of paper that detailed how to work out CO make, and so, being technical assistant, I thought I would start doing that for every section to monitor it.

This was in '87. That's before you became an undermanager, was it?-- That's correct.

You did do that then on a number of occasions, calculated the CO make?-- On a number of occasions. I become an undermanager in August of '87.

Yes?-- The first thing I did was - I wasn't asked to, I just went back and revisited the information from the 5 North to get an idea what the CO make looked like for my own interests and showed it to the manager. Subsequent or hindsight to this event has shown that the information I had was incorrect, and I thought it might be a good idea to start actually doing CO make just on - for every panel in the mine regardless of the fact that they were on development, just to give you a base level.

You did that then, did you?-- Yes.

After you were an undermanager?-- No.

This is before?-- That's correct.

Now, did you keep some record of that?-- Of the -----

You say just to give you a base level. Did you record it so somebody could have regard to it at some time?-- It was kept in a big graph book, but as soon as I become an undermanager, the next person to take over the job didn't pursue it.

Then after you became an undermanager, no doubt there were occasions then too when you had to calculate CO make?-- No, the last time I calculated CO make was in a Mines Rescue competition in '87.

Well, I suppose as an undermanager you could rely on others to calculate CO make for you. Did the deputies do that?-- I really don't know whether -----

Or the ventilation officer, did he do it?-- As far as I know, Jacques and Allan Morieson looked after CO make.

Anyway, you were more than familiar with the formula, that's the bottom line?-- Well, are you asking me if I could calculate it just before the disaster?

Well, I will ask you that?-- No.

Given that you did it a number of times in '87, were you still in a position where you could do it last year?-- If I would have gone back to first principles, because it's just litres a minute - I couldn't go off the top of my head - but if I went back to first principles and sat down for a while, I would have worked it out, yes.

You didn't need to go far back, did you, to get the first principles? It's a relatively straightforward formula, isn't that so?-- Yeah.

Now, what about the Graham's Ratio, is that a tool that you are familiar with?-- I am not familiar with it. I do know that it's the CO/O2 deficiency ratio and I know it compares the CO produced with the oxygen consumed, but as far as what figures actually mean, I have forgotten that bit.

Did you know what was significant in terms of levels then of the Graham's Ratio?-- In the figure levels?

Yes?-- No.

What was dangerous and what wasn't, for instance?-- No.

You had no idea?-- No.

The Graham's Ratio was something that was calculated as a matter of course on the Unor system, wasn't it?-- That's correct.

Did you ever have regard to that?-- I saw it in the column on the right-hand side and I figured that if it was set up like the other columns in that Unor system, then it would have a built-in limit, if you like, that would change the colour from green to red.

If it went above a certain limit?-- Mmm.

And you relied on that as an indication as to whether there was any problem being demonstrated by the Graham's Ratio, or being evidenced by the Graham's Ratio?-- Yeah, but like I said, I didn't really understand Graham's Ratio at all.

You didn't ever inquire from anybody what might be the appropriate level?-- No.

What were safe levels and what weren't safe levels?-- No, I tended just to look more at CO.

Now, during the time then that you were undermanager at the mine, 512 Panel was developed and then extracted; is that so?-- That's correct.

Now, I want to ask you some questions about your association with that process, that is, the development and extraction of 512. You were a shift undermanager?-- That's correct.

Throughout the whole of that period?-- That's correct.

During the development phase did you ever have involvement with any problems or matters that were raised as difficulties in 512 Panel?-- Not that I am aware, no.

And what about after the extraction phase commenced - if we can approach that as best we can on a chronological basis - do you recall what difficulties or problems were raised with you as undermanager in relation to 512? Just try to think of what matters might have been raised, and if we can deal with them then in chronological order?-- Probably the biggest thing that undermanagers were asked to keep an eye on was just the height of the workings that the blokes were working in. Is that what you are getting at, something like that?

The height of the workings?-- Yeah.

Well, were there any difficulties with that in 512?-- Well, there was a rule pressing urgency to ensure that no-one got hit by a rib fall because of the fact that we had had a fellow who got a broken leg from rib fall, I don't know, six months previous, something like that anyway, Dave Campbell.

In 512 or somewhere else?-- No, somewhere else, and because of the fact that the ribs in 512 had a habit of peeling away in sort of mid height, they didn't want anyone injured or killed by rib falls, and so the undermanagers - I know the undermanagers were addressed - I am not sure whether we were addressed as a group or individually - to ensure that no man was exposed to more than three metres. Also, during the extraction phase there wasn't to be more coal taken out than what was shown on the plan, so -----

Did something specific happen in relation to that?-- There was one instance where just down the bottom, the last cross-cut -----

Well, we don't need to dwell on it, where too much coal was taken out?-- That's correct.

And subsequently everybody was told that -----?-- Everyone was reamed out and just - yeah.

That's R-E-A-M-E-D. By whom?-- Albert and George.

Albert Schaus and George Mason?-- Yeah, got stuck right into them.

I suppose as undermanager you kept a close eye, did you, on the fact that - or the plans and made sure that there wasn't too much coal taken out?-- Yeah. I think the standard - I don't know about other undermanagers, but I used to walk in the section and between cars you tend to walk down - unfortunately an undermanager breaks the three metre rule, but being statutory, we would walk down and have a look at the last series of workings and then maybe walk around the back of the pillar and have a bit of a look in there, just to keep on eye on it, and you also had to keep on eye on the shuttle car driver. Because of the remote miner, the cable boy - it was a remote control miner. The miner driver and the cable boy

weren't at sort of - they weren't exposed to three metres as what maybe the shuttle car driver would have been, so you would have to keep an eye on him.

So, the shuttle car driver is more at risk; is that what you are saying?-- That's right.

From the high ribs?-- Yes, you had to make sure you didn't start driving down the ramp.

Now, apart from too much coal being taken out, the three metre rule you have mentioned, what other things do you recall arising in relation to 512 Panel, and I mean any matters that you became aware of, because you were undermanager and went down there -----?-- Well -----

Let me finish - or matters that were brought to your attention as undermanager or matters that you were told about by other people, whether they were undermanagers or miners or deputies?-- The only other thing that I saw that happened once or twice was a problem that we had similar to what we had in 402 in the fact that the air would sometimes creep out of the waste and up the tranny road, which is No 2 heading - very similar to what it did in 402 - and by putting up stoppings on - segregation stoppings and sort of reducing the flow through some prep seals, they were able to route air down the No 2 heading to prevent that occurring.

Now, were these things that you discovered because you were down there or because you read deputies' reports or -----?-- I heard about the air coming out of the waste from a shift change with an undermanager.

Could the witness see Exhibit 43, please, Your Worship? You will see that this is a deputy's report from in fact 11 June, it's been established, although the date put on it initially was 11 May, for the day shift, and it's a deputy's report of Bob Newton - I am sorry, Ken Guest, I should say, Ken Guest. I think that might be - is it Mr McCamley, those initials, "GM"?-- That's George Mason.

That's George Mason, I am sorry, okay. Now, that report there, it's a little bit hard to read, but let me help you. In the first inspection, the box on the left there, is an event that's described as, "Air coming back along top supply road to 8 cross-cut. Okay elsewhere in section." Can you see that?-- Yes, well, I can follow you, yeah.

And on the other side in the "Action Taken" column: "Stopping put up diagonally across 9 cross-cut. CH4 coming back is bleeding into return in some cross-cuts." See that there?-- Yes, I see it.

Again, it's a bit hard to read. What I have read is a result of careful examination. Now, that's 11 June. It seems that it was a Saturday day shift. Was that an event, as far as you recall, that you became aware of?-- No.

Sorry?-- No, no, I wasn't. I was on holidays from 11 to

19 June.

Well now, you weren't there then on 17 June then, but I would like the witness to see Exhibit 44, please, Your Worship. This, you will see, is a deputy's report. It's number 3401 for Friday day shift, 17 June, and it's a report from Reece Robertson. The first inspection refers to the finding of some 10 ppm of CO found between 5 and 7 cross-cut, No 2 heading, and you will see over on the right-hand side, "Action Taken", there is a note there, "Opened the stoppings across the bottom of the panel, bagged off across in front of the miner to clear the supply road." Now, in respect of ventilation there is a notation there, "Ventilation is recirculating in No 2.", and "Action Taken", "Altered stoppings as per undermanager's instructions." There is reference to the section being down, and there is a notation that the undermanager was asked to come and assist with the problem. Now, we have been told that Mr McCamley went down and investigated the waste that day and that he found certain things. You came back from holidays, what, some two days later on the Monday?-- Yeah, it would have been the Monday, yes.

Three days later, I am sorry. This is Friday the 17th. Do you say you came back on the 19th or the 20th, the Monday?-- Whatever the Monday was, yeah.

Monday the 20th. Were you made aware of these events, events involving -----?-- Which particular - the whole lot?

That's involving 10 ppm CO, the need to open the stoppings across the bottom of the panel and events involving Mr McCamley carrying out an investigation of the goaf?-- No.

We have been told that Mr McCamley found that there was some layering with recirculation in No 2 road but also that he detected a slight benzene smell or slight tarry smell. Were you ever told about that -----?-- No.

----- when you came back from holidays? Okay. If you had been told about that, is that something that you would have made some mental note of at least?-- I think I would have looked at the CO and made a comparison of what CO was a few days before. I would have - yeah, I would have thought about it, yeah.

Why would you have done that, because of the suggestion of some slight smell there?-- Well, no - well, if you got a smell and you have got that - any sort of sudden increase in CO, it could really - it could show that you are right on the pivot point, you might have a heating.

You will see that in the "General Comments" at the bottom of the second inspection what Mr Robertson has noted there is that, "An eye must be kept on No 2 heading to ensure that the ventilation doesn't recirculate." Now, it seems that that was put there by him to ensure that this position in 512 Panel was closely monitored?-- Mmm.

Not just the next shift, it would seem, but on an ongoing

basis to make sure that there was no recirculation. Did anybody ever tell you that there was a need to keep an eye on that No 2 heading in 512 to make sure that there was no recirculation?-- I heard about it - I can't remember exactly who told me, but I did hear about air coming out from the waste going up No 2 heading and to be aware of that - to just be aware of that.

Was that the occasion you came back from holidays, or aren't you able to say?-- I don't know what day it was that I was told that.

Now, you came back from holidays, you resumed your normal duties; is that right?-- That's correct.

Could the witness see Exhibit 45, please, Your Worship? Now, this relates to a shift on Friday afternoon, 24 June, and you will see that it's a report again from Reece Robertson, and you will see that there is a notation down in the "General Comments", first of all, that he found various measurements including 7 ppm of CO at - looks like 7 cross-cut between 1 and 2 headings at the stopping, and he goes on to say, "Also informed the undermanager that at this point there was a strong benzene-type smell and to keep a check on it." Now, did you ever read that report?-- I can't specifically remember reading this report. It was a habit of mine to read the reports of the deputies.

If you had been the shift undermanager, then more than likely you would have read the report, is that so, because that was your practice?-- That's correct.

Let me ask you: do you recall whether you did read that report at any time?-- I can't remember this report at all or being contacted by Reece.

Because, in fact, you were the shift undermanager on that occasion, weren't you?-- Yes.

On that shift; and you have no doubt become aware of these events more recently, haven't you?-- Yes.

Have a look at this document here. I do have copies for the panel and the parties, Your Worship. You will see that's for the same shift, the Friday afternoon shift, 24 June - your name is on it - it is your report, in fact - 512 section - it refers to Reece Robertson being the deputy, and mentions the other personnel. In the comments section it says a little bit about what sequences were being mined, and then in the down-time section it talks about the continuous miner and a waste inspection, but then that's it. There is nothing else said in relation to 512 there at all?-- No.

Now, Reece Robertson has told us that, in fact, he did ring and speak with you during that afternoon and told you that there was a smell in the 512 panel and suggested that it did need to be monitored. Do you have any memory at all of that occurring?-- Not at all. I am not suggesting that Reece didn't do it, but I can't remember him doing it.

As he does in his deputies' report, he described it - when he rang you he described it, he says, as a Benzene type smell. He said he asked you if you could keep a check on it and inform the appropriate people. Now, do you have any explanation as to why it would be that, first of all, he says that he called you and, secondly, that it is there in his deputy's report for that shift, but that you, it seems, have no recollection at all of a deputy reporting to you that there was a Benzene type smell in one of the operating panels under your control?-- The only thing I can think of is that he is - I can't really - I can't remember him calling up at all.

He was a thorough and efficient deputy?-- Reece was a deputy that I could rely on.

In fact, if one was to gauge by the quality of the reports that he submitted, you would have to call him-----?-- Artistic.

Well above-----?-- Yes, sir.

You would have to call him what?-- Artistic, I said.

Certainly artistic, but certainly thorough in terms of the amount of information that he put into his reports; isn't that so?-- That's correct.

And it would be consistent with his approach that he wouldn't only put that in his report, but that he would ring you and tell you about it and suggest that it be monitored and that the appropriate people be informed?-- Yes. As I've said, I'm not saying that Reece wouldn't have told me.

Well, I'm just asking you is there any explanation, then - assuming for the moment that he told you - would there be any

explanation as to why you have no memory of it now? I mean, it is a pretty significant event, isn't it, somebody telling that they smelled a strong benzene smell in a working panel, particularly one that's being extracted; do you agree?-- I agree.

A particularly significant event because it would immediately suggest that there may be a heating there?-- Well, it depends on what your CO would be.

It may depend in turn on what your CO would be, but the existence of a strong benzene type smell, I'm suggesting to you, would immediately raise in your mind the possibility that there could be a heating in the panel; isn't that so?-- No, I would always look at the CO as well.

Well, you may go on and look at the CO, but the fact is that the suggestion of a Benzene type smell, or the reporting of a Benzene type smell would suggest that there may be a heating and, of course, some further investigation would need to be carried out?-- I agree with that.

You see, I'm asking you-----?-- Yes.

-----what possible explanation there could be for you having no memory of it or, at least, it appears, not doing anything in relation to it?-- I can only theorise what my actions would have been after he would have rung me. My practice would have been if he had rung me at the end of the shift to pass a verbal message on to a deputy on the next shift to keep an eye on the section or to ensure that nothing - you know, particularly with CO levels - doesn't change.

But a strong benzene type smell in a panel would demand more action than simply a verbal - or oral discussion with the on-coming deputy suggesting that he keep an eye on it. It would demand greater action than that, wouldn't it? Wouldn't you need to do some further investigation to find out what the CO make pattern is, or at least to have a look at the - as you suggest yourself - at the recent CO levels? I mean, you would have to do something, wouldn't you?-- Yes, I would have done that. If he had have rung me up I would have asked him what the CO would have been.

Yes, for that day. In fact, he told you what the CO was. He told you that it was 7 ppm at 7 cross-cut between 1 and 2 headings. He told you that. Let me ask you: if he told you that he had 7 ppm, that would only make you even more concerned, wouldn't it, that there was some sort of heating, because the reading in the morning was 6 ppm?-- I wouldn't be concerned over a difference of 1.

You wouldn't be?-- No, sir.

Not even sufficiently and in conjunction with a report of a strong benzene smell to go and carry out some thorough investigation of what's going on in that panel? It wouldn't prompt you to do that?-- I am trying to establish whether in hindsight you would want me to do it now with the knowledge I

have now, or do you want me to answer in the way I would have acted in that time?

I am asking you to answer in the way you would have acted at that time. You see, you have already told me that your training in respect of spon com indicated that the things to look for, if you were wanting to see whether there is spontaneous combustion, would be a smell, a haze, CO level, and CO make. I think you did say that you were aware of the Graham's Ratio, but you didn't really know what levels that should operate at anyway, so we will put that to one side. In this case, you had a smell, you had a CO reading of 7 ppm. What I'm saying to you is why wouldn't you, in those circumstances, go ahead and carry out a thorough investigation to see what was going on in the panel?-- Well, it totally depends on what time he would have contacted - I'm just telling you how I would have acted depending on the time of the day. If it would have been before I went down and done my inspections, then I would have gone with him and gone and had a look, but if he had rung me up at, say, 10.30 before he had just come out of the pit, or told me - he might have told me, actually, when he got out of the pit - then it would be just before the night shift and I - as I said, I would have given a verbal instruction to the deputy on night shift.

Well, this is a Friday afternoon, and you say that it's at least normally your practice to read the deputies' reports?-- Yes, sir.

When you read the deputies' reports, do you normally acknowledge that you have read them by putting-----?-- By initials.

By putting your initials on them?-- I wasn't disciplined in doing that all the time.

You weren't?-- No, sir.

Because there are two copies, aren't there?-- Yes, one stays in the report - one stays in the deputies' book and one comes out with the deputy.

Which one would you put your initials on?-- It would be the top one - the white colour one.

The top one - the one that comes out?-- That's right.

Your Worship, I tender that underground shift report dated 24 June 1994, afternoon shift.

WARDEN: Exhibit 179.

ADMITTED AND MARKED "EXHIBIT 179"

WARDEN: If you are going on to another subject, we will have five minutes, Mr Clair.

MR CLAIR: Yes, I am going on to another subject at this point, Your Worship.

WARDEN: Thank you. We will have a short adjournment.

THE COURT ADJOURNED AT 3.40 P.M.

THE COURT RESUMED AT 3.54 P.M.

MICHAEL ANDREW SQUIRES, CONTINUING:

MR CLAIR: Mr Squires, you mentioned that you were away a week in June; is that right?-- That's correct.

And then you came back. You were there right through until - when was it, the week of 25 July, is that right, and did you have a period away again, 25 July?-- 21 to 31 July.

21 to 31 July?-- Yeah, and I had an RDO on 15 July.

Now, did you at some stage in July - you say you were away from 21 July?-- That's correct.

You were back on deck then on 1 August?-- That's correct.

When you came back on 1 August did you become aware that there was a new system in place, pursuant to a direction from George Mason, whereby deputies were to take a full set of measurements on each shift so that the CO could be calculated on a - CO make I should say, could be calculated on a shift by shift basis?-- No.

Did you become aware at any time of events on 22 July that caused some concern which we have been told led to that direction?-- Only hindsight, sir.

Nothing at the time?-- No.

When you say hindsight, you mean after the explosion?-- That's correct.

Now, when you came back on the first then no doubt you did read the deputies' reports for the shifts that you were on?-- Yeah, I - yeah.

Did you notice that they were taking additional readings?-- I didn't notice anything reading wise until - I think it was Friday day shift's report. Now, that's the first one that I can remember seeing any sort of readings on.

Was there any talk at all amongst the undermanagers about any concern with 512 Panel in terms of the CO make?-- Well, no-one expressed to me any concern about CO make or undermanagers - I wasn't privy to any conversations talking about CO make of 512.

Was there much interaction between the undermanagers?-- Well, normally we -----

You've spoken about an overlap and you got a discussion then. Would you talk about what you had for dinner the previous night or would you talk about what was happening at the mine?

What sort of things generally would you talk about?-- Well, during that overlap is about the only time you get to see other undermanagers and during that time you sort of - it was a case of one undermanager, the one that was on was usually - the one just started was usually rounding up fellas and organising things, so there wasn't really - I suppose if you look at it that way there wasn't, I suppose, a lot of interaction like that.

Perhaps I should at least ask you this: if the witness could see Exhibits 93 and 94, please, Your Worship. Have you ever seen those documents before?-- The CO make graph was on the noticeboard in the undermanager's office. I don't think I've ever seen this. I don't know whether I'm correct, was that on the rear of the graph like - I think it was, but - no, I haven't actually seen that, but I saw that.

Just to be clear on this though, I'm asking you there about specific documents, you see?-- Okay. I've seen document 93, but I don't think I've seen document 94.

Let me just say it again: I'm asking you there about specific documents rather than documents in that form. I take it from what you say that you have seen a graph on a noticeboard. Whereabouts?-- Well, it was on the - sort of like adjacent to the undermanager's table on the noticeboard.

Was it that graph there with those actual markings on or was it a graph in similar form or aren't you able to say?-- I don't - I can't say for sure.

I'm just trying to keep the record clear. I mean you are saying you saw a graph on the wall, it had - it was basically in that format?-- Yes.

And it had some sort of plottings on it?-- That's correct.

Showing a graph?-- Yes.

But are you able to say whether it had those dates along the bottom or that particular graph on -----?-- No.

You are not?-- No.

That's all right. I take it from what you say then you can't really say whether you've seen that document before, that very document?-- No.

You've seen one that in form?-- No, no.

Okay. I'm just not wanting you to talk yourself into saying you've seen something which you haven't, you see? I just want to keep the position clear. You can put those to one side. That can go back. The graph that you did see on the noticeboard, what did you understand that to be?-- Well, it was a CO make graph for 512 extraction panel.

Was it updated from time to time?-- I can't remember seeing it being updated, I just presumed it would have been updated

similar to what Cocky did with the ventilation thing once a month.

When you say as Cocky did with the ventilation thing, had you seen some sort of table on which he set out the ventilation readings or is that the table that you think you may have seen on the back of a graph?-- No, I never saw the back of the graph, but because of the fact I was - being a technical assistant before, and I've done ventilation surveys before, the ventilation table was very similar to the one that I used to do, so I sort of knew that was replaced once a month and -----

How much notice did you take of this graph that was on the wall in the undermanager's office, 512 CO make?-- Just look at it occasionally.

Did you take an interest to see where the graph was heading, what the readings actually were?-- I didn't actually look at the graph to the actual readings, I was just looking at more the trend it was going up.

The extent to which it was going up, did that worry you at all?-- No.

At the times that you looked at it?-- No.

Do you remember when you last saw that or last saw a graph of that kind prior to the explosion?-- Well, truthfully I can't say for sure I definitely saw it the last week, but I would presume that I would have seen it in the last week on the noticeboard.

Now, after you came back on 1 August and when you saw the deputies' reports during that week did you take much interest in the CO readings?-- I look at the - normally my practice is to look at the Unor screen once a day. Not at any set time, but just once a day. I'm also aware of actually remembering seeing the CO reading from the Friday day shift, but - does that answer your question?

Well, is there anything more that you want to say about it?-- No, that's about it.

I asked you whether you took much notice of the CO readings in the deputies' reports during that week?-- I can't recall specifically any CO readings except the one on Friday, and apart from looking at the Unor screen.

You did say that the thing that you regarded as significant in terms of symptoms of any spontaneous combustion was really the level of CO?-- That's correct, yeah. The trend of CO parts per million.

Were you looking at the deputies' reports during that week to see what the trend of CO was?-- Well, I know that I would have -----

Did you rely on what you looked at on the Unor?-- Probably a

combination of both. It's just that I really honestly can't remember specific readings on the deputies' reports during the week.

Did it occur to you at any time that it would be wise to calculate a CO make for the panel during that week?-- I've never really - I've still got difficulty with the CO make. Like I said, for me to sit down and calculate it I would have to work out what the formula was first, and I hadn't given any thought of calculating CO make.

At least for some time, you've told us?-- Yes.

Could the witness see Exhibit 127, please, Your Worship? We have been told that that's a log showing the alarms that registered on the Unor system from 27 July through until the time of the explosion. There are a couple of them there that I want to ask you about. You were - back on 1 August - on 2 August you worked an afternoon shift; is that right?-- That's correct.

On 3 August you worked an afternoon shift?-- That's correct.

That was the Wednesday. If you have a look at the alarm log there and go down to the seventh entry from the top you will see that that shows that there was an alarm which was registered on the Unor system at nine minutes past 11 on the Wednesday. It was in relation to point 16 which was the 512 top return, and I take it from what you say that you wouldn't have been there at nine past 11 because you worked the afternoon shift; is that right?-- That's correct.

But no doubt some time after you arrived you would have looked at the Unor system on that day?-- I said that I would look at the Unor screen, but it could have been any time during the day, not necessarily at start of shift.

Well, any time during the shift?-- Yeah.

Your afternoon shift started - well, for you, what time?-- Well, we would normally - undermanager would normally arrive at about quarter to two.

Do you remember who it was you took over from on that day?-- Yeah, I think George was on day shift.

Did you have any discussion with him about any alarm that had sounded in respect of the 512 top return CO level?-- I can't remember having any discussion with George on that.

Well, if it had taken place do you think you would remember it?-- I really don't know.

You see, if you look at the next column which is the one you've got your finger on there now?-- Yes.

You will see that the alarm was actually acknowledged at five past seven that night. Do you recall whether you were involved with acknowledging that alarm at all?-- No, because

my number is not there.

Well, what is your number?-- 67.

And do you invariably use that number?-- That's the only number I would use.

Why is that?-- Because 67 is the abbreviation of my lamp - cap lamp number, 167.

What led you to use your abbreviated cap lamp number when you were acknowledging alarms on the Unor?-- Well, someone told me that's the way you acknowledge them.

Who told you that?-- I can't recall who told me that.

Can you remember when you were told that?-- It was a long time ago, probably when I - probably when I become an undermanager or when they got the new Unor system in.

When they got the new Unor system in?-- That's correct.

That was approximately when?-- I don't know that either.

you don't know?-- I can't remember.

You mean a number of years ago anyway?-- Yeah, well, during the 5 North thing, for example, they used to have a Maihak system. They only had CH4 on the other one. So they changed -----

You are not talking about the new computer, you are talking about the whole of the new Unor system?-- Yeah, the new Unor system that picks up the four gases.

Now, you have got no idea, no idea who told you to use your cap lamp number?-- No, I can't remember.

Did you ever tell anybody else when they acknowledged an alarm on the Unor that they were to use their cap lamp number?-- No, I just thought that was the procedure.

Well, you were an undermanager, you had some responsibility for making sure that systems were in place and that they were observed. Did you ever instruct anybody else that they were to use their cap lamp number?-- I don't think - no, I've never instructed anyone to use their cap lamp number.

Did you notice whether other people were using their cap lamp number when they acknowledged alarms?-- No, I just thought that was -----

You never had an opportunity or -----?-- I thought that was the system everyone was using because that's what I was told to do.

As undermanager were you ever provided with a print-out of an alarm from the Unor? The system automatically prints out whenever it alarms, doesn't it? It prints out an alarm

report, and then no doubt something would happen with that after it's printed out; isn't that right?-- The print-out - well, yeah, if an alarm went on the Unor it would print-out on the printer.

That's all I wanted to establish on that front. You looked a bit puzzled about that?-- Yeah, well, as far as I know - yeah - no, that's right.

So an alarm report prints out. As undermanager were you ever provided with a copy of an alarm report which had been acknowledged by somebody else?-- No.

Never?-- No, they were -----

Did you yourself find that you were in a position where you had to acknowledge alarms on the Unor very often?-- Not very often, no.

Well, how frequently?-- Infrequently. I suppose you could count it -----

Once a year, once a month, once a week?-- Okay. A rough figure would be once a month, I suppose. A lot of the time your Unor alarms tend to be - most of the ones I've ever accepted are your calibration alarms.

How do you mean your calibration alarms?-- Well, if your calibration goes off it alarms so you get a leckie to get over and check it.

Did you ever then acknowledge an alarm where it was a breach of a set point value on one or other of the gases that were being monitored in the mine?-- I really can't say for sure because seals - like the only time you get a breach of a set point level would be when you've left a thing in your seal.

When you've left a -----?-- When you seal off.

A what in your seal?-- When you've left a sensor inside your seal. It's extremely rare that you actually get sort of a trip, if you like, of an alarm for a gas setting under normal development.

Or extraction?-- Or extraction.

Isn't that the purpose of the system, that the system is there so that if there is a build-up of gas that exceeds the set point alarm value then it trips the alarm?-- Yeah, it's designed -----

That's why it's there?-- That's right.

How did you -----

MR HARRISON: Can he be allowed to continue to answer it and not have you butt in all the time like that?

MR CLAIR: Sorry, I didn't hear what Mr Harrison had to say.

MR HARRISON: I'm just objecting that he was in the process of giving an explanation and you went over the top of him. I just ask that you let him continue on with his answer.

MR CLAIR: I will give him every opportunity, Your Worship

WITNESS: My understanding is what you are trying to highlight is there are alarm pre-sets put in so if it goes over the pre-set it triggers an alarm and the function of the alarm is to draw someone's attention to the fact that it has gone over a pre-set value; is that correct?

MR CLAIR: Yes, and what I was putting to you is that is precisely the purpose of having an alarm system, isn't it? So that people are made aware of the fact that there has been a breaching of some alarm set point, that is that the gas has built up more than was expected in some area and that it needs to be attended to?-- I would agree with you on the fact that on development you would get that where if it trips a level put in for development then it would require attention as drawing your attention to it. In a sealed situation where you are getting a constantly changing atmosphere behind there it - yeah, your alarm can still draw peoples attention to the change.

We will come to the sealed situation. We are not dealing with that though on 3 August, are we?-- No, no.

For the 512 top return?-- No.

That was a panel that was still being extracted at that time and somebody had carefully set up the Unor system so that if the CO exceeded a set point value of eight the Unor would alarm, that would cause a siren to sound and then people would be made aware of the fact that there was too much CO in the 512 top return, right?-- Yes.

And if you look at what you've got in front of you you will see that that's precisely what happened at 11.09 on that day in August, that the CO went in excess of eight and it caused that alarm which is shown on the log, you see?-- Yes, I see that.

Right. You weren't there at the time. Did anybody at any time mention to you that there had been an alarm of that kind that day?-- I can't remember anyone saying that to me.

You were the undermanager-in-charge that afternoon; are you able to say how it was that that alarm appears to have remained unacknowledged right through until five past seven that evening?-- The siren itself wouldn't have been going all that time.

No, I appreciate that. We have heard that you can de-activate the siren by pressing a button at the Con Log. This log shows when the alarm was acknowledged at the Unor system. What I'm asking you is as undermanager-in-charge of the mine that afternoon are you able to explain how the alarm remained

unacknowledged at the Con Log right through until five past seven that night?-- No.

Do you know who it was that acknowledged it and put in the number 11?-- I'd only be guessing.

Well, is it a guess based on some particular knowledge or -----?-- Well, there is not too many people who know how to accept alarms, I don't think. I would assume it would have been a deputy on the surface.

Did anybody mention to you that they just accepted an alarm on the Unor - acknowledged, I should say, an alarm on the Unor showing that the CO in 512 top return had breached the alarm level? Was that reported to you at any time?-- I don't remember anyone reporting that to me.

Would you expect that it would be?-- I would expect if someone acknowledged an alarm that they would let me know or if they noticed something out of the ordinary with the Unor that they would let me know.

Well, it seems that whoever acknowledged it left the set point value for the alarm at a level of eight, because if you look at that sheet in front of you, Exhibit 127, you will see that that set point value of eight was breached again on Friday, 5 August. Do you see that?-- Yes, I see that.

Now, on Friday, 5 August, you were on the afternoon shift that day; is that right?-- That's correct.

You would have arrived there again at what time?-- Approximately quarter to two.

Did anybody mention to you on that day that there had been an alarm on the CO level in the 512 top return?-- No.

Now, if you had been told - let me ask you this: if you had

been told that there had been an alarm on that 512 top return with a CO level of 8.33, what would have been your response?-- Well -----

This is on 5 August?-- On 5 August. Well, I would have just made sure that - to get an idea of what the characteristics of the CO for the previous week would have been.

How would you have gone about that?-- Well, I probably would have just asked the deputy, just asked him what sort of CO readings he had been picking up in the section.

But you said you would have checked on the value of the CO readings for the panel for the past week, is what you said a moment ago. How would you go about that?-- Well, there is a way of going about that, but what I am saying is I don't want to give you the impression that that's automatically what I would have done. There is a way of going about it and that's to go in to a time graph on the Unor and you can raise the graph up, you specify the monitor point, you specify the time range and it will give you a log of what the readings were over any time range that you have specified.

There is another way to go about it too, isn't there, and that would be to have a look at the deputies' reports which would be there and accessible?-- Yeah, they would be accessible for the week that you are on, that's correct.

And because you had seen those deputies' reports, you knew that they were recording the CO on each of their shifts, CO levels?-- As I have said before, I don't remember seeing any CO levels on the deputies' reports, except for the Friday. I am not saying they weren't there, I am just saying I can't recall any before the Friday day shift.

Well, could the witness see Exhibit 152, please, Your Worship? Now, if you can go to the fourth page of that, I think it is, the second back page, you will find a table there. Rather than take you to each of the deputies' reports, I will explain that we have been told that that table has been drawn up showing a number of things but including the readings that have been recorded on the deputies' reports?-- Mmm.

And you will see that in fact if we start on 1 August, which is when you were back there, and having regard to what you have just said, that the wise thing to do would be to look back over the deputies - look back over the CO readings for the past week, then you would find that on 1 August on night shift there was a CO reading of 7 ppm and the next 8 ppm. Just tell me if you want to see the deputies' reports, I can show them to you?-- No.

The next one is 8 ppm, and then if you come down you will see it goes 5 and then a series of 6 ppm, and then on 4 August 7 ppm on three occasions, in effect; do you see that?-- Yeah, I see that.

On 5 August, the very Friday, two readings of 7 ppm again; you

see those?-- Yes, I see those.

Now, first of all, let me ask you this: if you had looked at those readings showing the 7, the 8 and then consistently the 7 towards the end of the week, what sort of response would that have produced in you in itself? I mean, would you have been comfortable with that as an undermanager at that point or would you be concerned about it?-- No, the variation in Drager tubes between people taking readings can be up to two parts. It really wouldn't -----

Well, can you explain what you mean by that?-- Well, it depends on - my understanding of a Drager reading -----

I think we are prepared to accept that they are subjective and that you can have natural variation?-----

MR MORRISON: I am sorry, listen, we can't keep going on really - apart from anything else, we can't keep going on with the sort of discourtesies being examined now, thank you very much, and we can't keep going on in this Inquiry with witnesses being overridden as they try to answer, and so can we please hear what the witnesses have to say? It's hard enough with witnesses who have quiet voices anyway without the added problem.

WARDEN: Yes, thank you.

MR CLAIR: Well, Your Worship, I think that it's appropriate to say that sometimes when counsel is questioning, he realises that the witness is about to give an answer that really isn't responsive to the question and which won't take the matter anywhere and that it might be appropriate to interrupt the witness and to say, "Well, look, we are prepared to accept this, but", and then go on to get a meaningful answer. It's something which I witnessed my learned friend, Mr Morrison, doing many times over the period of time that I have sat here respectfully listening to him, and I don't think that there was anything improper in what I was about to do then. If Mr Morrison wants to hear the whole of the answer, I am quite prepared to let the witness give it.

WARDEN: Well -----

MR CLAIR: It just may be a few minutes that we can otherwise save.

WARDEN: Let the witness give his answer. If it's misunderstood, we can soon correct it.

WITNESS: My understanding is that a variation in CO of one or two parts can be due to, and often is due to various factors such as how the fellow reads it, how a deputy reads the tube, for example, and if he took the right number of pumps and things like that, so a variation of two parts CO, to me, wouldn't put any sort of distinctive - it wouldn't draw my attention and sort of start signalling to me that there is something wrong.

MR CLAIR: Okay. Now, can I say that we are prepared to accept that because of the subjective ways in which tubes might be read that there can be these variations, but can you just have a look at the figures there, and you will see that there is quite consistently a series of figures of 7 over the Thursday and the Friday which might not be readily dismissed as some consistent inaccuracy in the deputies' readings; you see?-- The Thursday and the Friday?

That's the 4th and the 5th. What I am asking you is: if you did become aware of those readings, what sort of a response would that have provoked in you?-- A one part increase?

Yes?-- A one part increase in CO?

There are consistently readings of 7 there. I think I asked you also about the earlier reading of 8, which you might dismiss as an aberration back on the 1st, but I would encompass that in the question too. I am asking you what would be your response, as the undermanager in charge on the Friday, if you looked back and you saw those readings in terms of CO parts per million? Would it give you any concern or not?-- Over the two days from the 6th to the 7th?

No, I am talking about the whole of the week. We were talking about from the 1st through till the Friday, the 5th?-- That increase of one - I wouldn't have - I don't see that being abnormal.

Now, if you look at the next column you will see that there is a calculation made there of litres per minute. Now, I appreciate that you say that you hadn't calculated CO make for some number of years, it wasn't your practice to do it any more, but let's assume that you were made aware of this alarm or of any other feature that might give you concern about the 512 Panel and, therefore, decided to carry out some investigation. Would you think that it would be sensible as part of that investigation to look at the calculation of CO make over this week?-- Are you asking from a - I just want to get this clear - are you asking from the point of view of if I was on the shift right now or are you asking from a hindsight point of view?

From a hindsight point of view?-- From a hindsight point of view -----

Let's go back to where you were on the Friday afternoon?-- Yes.

At the mine?-- Yes.

I am asking you to assume that you have either been made aware of the fact that there has been an alarm on the CO production in the 512 top return or that some other feature has been drawn to your attention that raises some concern on your part that there might be at least a possibility of a heating in 512?-- Would I have worked out the CO make?

Yes?-- No.

What I am saying is: as part of an investigation would you think that it would be sensible to work out the CO make over the past week?-- My actions on Friday were that I would not have worked out a CO make for the week. On hindsight action I would make out a CO make for the week.

You are talking about now?-- Yeah, but -----

Knowing what you do now?-- Yeah.

Well, put that to one side?-- On Friday I wouldn't have made a CO make for the week.

Well, if you had, then from what we have been told, these are the figures that would have been produced for a CO make over that week; you see?-- Mmm.

From 1 August. I take you back to 1 August there?-- Yep.

I want you to assume that they are correctly calculated and you find your CO make of 17.03 on 1 August, the same day 18.94, and then there is a low one of 11.57, and then the next day 13.42, 14.2, 14.2, 13.42, 14.2, then on the Thursday 16.57, 15.65, 16.57, and then on the Friday 16.57 and then one of 14.27. Now, if an investigation had been carried out and produced that information to you as undermanager on that Friday afternoon -----?-- Yes.

----- what would have been your response?-- It would have just looked like a normal CO make for the section.

You would be quite happy about that?-- Yeah.

18.94 lpm wouldn't have worried you?-- No, I would just be looking at the rate, looking at the rate. It's peaking up and down exactly like the graph I did for 5 North. It just peaks up and down like that. I would be looking at where it changes and goes exponential.

As part of your training were you ever instructed, or did you ever discover at what levels the CO make might need to be treated with some care?-- No.

In that book that you referred to, Strang and Mackenzie-Wood, earlier?-- Yes.

Isn't it the case that there is in that work a formula suggested whereby it's said that at 10 lpm then a panel might need some close monitoring, you would be concerned about it, and at 20 lpm then you know that you have got a dangerous situation on your hands, that is, in terms of a heating?-- In hindsight, sir, I have read that book and I have seen that that's the case, but before the disaster I was unaware that that was there.

You had had the book but you hadn't read that part, or do you think you had read it and forgotten it?-- I may have read it when I did my Mines Rescue induction and studied for the

exams, but I had not looked at the book since the last exam.

Now, you can put that Exhibit 152 to one side. Now, this was the Friday, in fact Friday the 5th that we were just talking about, but in fact is there a formal meeting at the mine on each Thursday convened by Mr Mason and attended by various staff members at which there is a weekend work schedule drawn up?-- Yeah, the weekend overtime work thing was done on Thursday, yeah.

Had you attended that meeting on the Thursday?-- No.

Did you receive any instructions as to what the weekend program was to be?-- Yeah, I got - I saw George on Friday and he gave me a sheet with numbers of guys and work to be carried out for the weekend.

You were rostered as the undermanager on the weekend of 6 and 7 August?-- That's correct.

At the time - I am just looking at what you set out in your statement here, it might shorten it - at the time you received that plan it showed that there was to be a Saturday night shift, this is in addition to normal deputies' inspections; is that right?-- That's correct.

A Saturday day shift and a Sunday day shift and Sunday afternoon shift?-- Sunday night shift as well.

And the Sunday night shift. The jobs to be completed, according to that plan, were the 4 South prep seals?-- Yes.

And 512 preparation?-- Yes.

That is, to recover all the equipment and getting materials to the prep seal sites; is that so?-- That's correct.

Now, did you have an understanding at that stage as to when 512 Panel was to be sealed?-- My understanding that I got from the sheets was that we were going to seal 512 on Sunday.

You say you got that from the sheets?-- Yes.

The sheet that George Mason gave you?-- Yes.

Was it actually written down? When you say it was on the sheets, was it part of the typed sheet?-- It wasn't typed, it was just a handwritten sheet.

A handwritten sheet?-- Yeah.

Who was it that would make a decision like that about when 512 was to be sealed?-- George and Albert would make the decision.

Let me ask you: did you have any conversation with George Mason that day about any view that you had as to when 512 should be sealed?-- I can't remember whether I did or not.

Did you keep this particular sheet that you mentioned? Was it just a handwritten one for you or was it a photocopied one?-- Well, I think it might - I photocopy the sheets myself, so if I lose the original I have still got a copy for the weekend. Normally George would rule it up, but he was pretty busy because he was running the day shift, so he had it sort of like handwritten.

And you are quite clear that that sheet indicated that 512 was to be sealed on the Sunday?-- My understanding - on hindsight I found out that George wasn't - didn't have an intention to do that, but to my mind I was clear that we were going to seal on Sunday.

Well now, that afternoon, the Friday afternoon, did you have any conversation with George Mason during which you said that you would like to seal 512 Panel during the weekend without giving any reason for why you wanted to do that?-- I can't remember having a conversation with George. I'm not saying I mightn't have, but I can't remember actually specifically saying anything to George about it.

It wasn't the case that you said that and then George Mason gave it some thought and told you subsequently that the planned schedule would be followed, that is, that the panel would be sealed sometime during the following week?-- No, if George would have told me it was to be sealed in the following week, I wouldn't have changed the plan.

As far as 4 South prep seals were concerned, they were to be done on the Saturday night; this was the plan on the Friday afternoon?-- Yeah.

And the Saturday day shift?-- Yes.

That's the Saturday night shift and the Saturday day shift, and the 512 prep seals were to be worked on the Saturday night shift, the Saturday day shift and the Sunday day shift?-- Yes.

Men were also scheduled to work on the Sunday afternoon shift doing preparation ready for the start of the next week's production on the Sunday night at 10.15?-- That's correct.

Being the Monday night shift?-- Yes.

Now, you attended for work, I think you've told us, on the afternoon of Friday, the 5th. When you came there, did you have an overlap or a discussion with George Mason about what had occurred during the previous shift?-- George got stuck down the pit that day so I - I think he rung me up. He was looking for a lift out of the pit for shift change, but we didn't have a Rover there to get him out, so we didn't have what would be a normal shift change. I sort of gleaned as much information off George when he rung up, plus whatever other people were running around the place. To give an example, I think it was Peter Rose in 5 South, for example, rung me up and said that the miner got fixed and he rung a few minutes later to say that it's stuffed up again.

Well, your first contact with George Mason was over the telephone?-- Yes.

Did you speak with him some time later in the afternoon?-- I would have bumped into George later in the afternoon.

When did he give you this piece of paper or how did you come by this piece of paper?-- He would have given it to me. I would have gone and seen him because it was on the weekend.

You are not able to say what time of the afternoon it was?-- No.

Did you read the deputy's report from the previous shift?-- I remember seeing Dick Stafford, which - are you talking about all?

Mmm?-- I can't remember them all. I do remember the 512. I don't know why, but I do. It was sitting - probably because it was sitting on the shift report - the undermanager's shift report, and so I saw it straightaway before I saw my own.

Right. Now, you went about your work that afternoon. I think you mentioned in your statement that you sent a fitter into 5 South. You sent men to 512 on preparation to continue the recovery of equipment there; is that right?-- Yes, that's correct.

And you also sent some men to 6 South?-- That's right.

And a tradesmen and fitter to 1 North-west to do some repairs on the continuous miner there; is that correct?-- That's correct.

You had some discussion with George Mason about whether you would get any worthwhile production out of 5 South because there was a problem with the miner there; is that so?-- That's right.

And at some stage during your shift Michael Caddell started work; is that right?-- Yeah, Mick would have come in about 3 o'clock.

And did you have some discussion with him?-- Yeah, I would have told him what - what was going on at 512. I had enough - because I was cancelling production, or George and I talked about it - production was cancelled in 5 South - Mick was sort of - I could actually put Mick to a certain particular place rather than have him look after a lot of sections, and say I told him to look after 512.

And did you arrange - or he told you he would do a waste inspection during his shift; is that right?-- Yeah, that's what I can remember, yes.

Now, did you go and do some inspections yourself?-- Yes.

Can you just tell the Inquiry where you inspected and what happened during those inspections?-- Okay. First of all I jumped in the Rover that the TA and the fitter were working in 1 North-west and I went down with them, had a look around the 1 North-west, then because the fitter and the TA were on a big job, they weren't needing that Rover, so I took that Rover and I can't remember whether I went to 4 South level prep seals - yeah, I probably would have gone to 4 South level prep seals first just to have a look to see what the other shifts had done, and then I would have gone into 5 South, had a look there. The fitter was still working on the miner. When I went in there, I think the fitter was out and they just dusted the bord which I asked them to do, and washing out the miner waiting for the fitter to come back. I went into 512 and checked up on how the progress was going there.

How far into 512 did you go?-- I can remember - I parked outbye and I walked in - I walked into the tranny road and had a look down in there where the last bottoms were taken out and also walked down to the belt road, did the same thing; had a look at the fellows working there on the belt road prep seal. The miner was on its way of getting trammed out. I had a look at that sort of locale there. I think I went down to the drill after that and I think I came back down again to see how the miner was going because it was playing up a fair bit.

This is in 512?-- That's correct.

Yes. Did you notice anything unusual at all in 512?-- No.

How close to the goaf did you go there?-- I sort of walked right up until - just started walking down the ramp in 2 and with 3 - I sort of checked 3 - visually checked it, looking straight down, and with 3 to 4 I sort of stood on the edge of where it tapered off down to the bottom.

You didn't go into the top return, I take it?-- I can't recall going in the top return. But I did go in the top return - I remember I did a top return inspection the previous day on the Thursday.

Had you found anything unusual on the Thursday?-- No.

Now, you returned to the surface again after you completed your inspections?-- Yes, I took the Rover back to 1

North-west and went to the surface.

What did you do after you got back to the surface?-- Well, I can't specifically recall, but it would have been around - maybe ringing up and finding out how the miner was going, and doing any paperwork, walking around the lamp room, walking around the deputies' cabin.

Some time later did you see Mick Caddell?-- Yeah, I walked into the deputies' cabin and saw Mick later.

What happened there?-- I don't know what time Mick got up, but he was in the process of having crib and he was talking to Bony, and so I just sat down and just listened to him talk to Bony, and he had mentioned about his waste walk in 512.

What did he say about it?-- He said that while he was down there that he had smelled a benzeney No 4 smell down in one of the cross-cuts down the bottom.

Are they the exact words that he used - a "benzene No 4 smell"?-- Yes, that's correct.

Yes?-- And that I sort of expressed surprise - "Really?", sort of thing. I really can't remember the rest of the conversation, but that's - I can remember that bit.

Well, when he told you that, you say you were surprised and you said, "Really?"?-- Mmm.

Did you do anything else at that time about what he told you? Did you write down what he was telling you?-- I didn't write anything down in my shift report.

We will come to the shift report in a moment, but in terms of the exact words that he used to you, are you just relying on your memory at this stage?-- At that stage, yes.

Well-----?-- I was very surprised that that was reported.

He described it as a-----?-- Benzeney No 4 smell.

Benzeney No 4 smell?-- Yeah.

What did you understand him to mean by that?-- Well, it was a different smell than what the normal goaf smell was.

Well, different in what way?-- Well, specifically, like I've said before, I don't really understand what benzeney is because I have never smelled benzeney, but a No 4 smell to me would be what he would be describing as the afterdamp smell of No 4 explosion, and the afterdamp smell tends to show signs - well, afterdamp smell normally you would regard as the smell of combustion products.

Did his report suggest to you - that is what he told you - benzeney No 4 type smell - did that suggest to you there might be some combustion problem in the panel?-- When Mick told me, two things that I had troubles with was, first of all - well,

I hadn't received, as far as my knowledge, anything from anyone else indicating that there'd been any sort of report of anything like that, and the second thing is that Mick is an experienced deputy, but he hadn't been subject to the 512 waste, like, on a regular basis - not like, for example, you know, 512 extraction deputies. So, because of that, I was more surprised, rather than thinking about - I was very surprised or questioning the report.

Are you sure he didn't say to you that it was a strong tar smell?-- No, he didn't mention tar to me.

Are you quite-----?-- I'm positive.

Sure about that?-- Positive.

Yet you made no note of it at the time, and later when you made your shift report, no note of the words he used?-- Not on my shift report.

Anywhere else?-- No. I would have - as I said, I'm just trying to help the Inquiry by trying to detail what my practice would have been and my practice would have been in that circumstance to check to see what the CO readings were and also to report it to the deputy on the next shift.

Did you do either of those things?-- I did both of those things.

How did you go about checking what the CO readings were?-- The CO readings - I would have gone to the Unor screen, had a look and seen what it was there, and the deputy - I would have definitely told the deputy.

Who was the deputy on the next shift?-- I can't recall who the deputy on the next shift was.

The deputy on the next shift was Mick Caddell, wasn't it?-- I beg your pardon. I'm confused, I'm sorry. I would have told - I told Mick Caddell to keep an eye on it.

You told him to keep an eye on it?-- Yes.

You went to look at the Unor screen and told Mick Caddell to keep an eye on it and they are the only actions you took in relation to a report to you in terms you describe as a benzeney No 4 type smell?-- Yeah, I checked the - Mick had to do a second - my memory - if my memory is correct, Mick had to do a second inspection after we had talked in the deputies' cabin.

Yes?-- From my - I would have to have a look at his report, but from recollection, the CO reading that he got on his second inspection was the same as the first and so those three things would have been what I would have done.

Now, did you really think that that was sufficient? As an undermanager in charge of this production panel - production had finished, in fact, so it was towards the end of its

life?-- It was finished, yes.

Was it a time when you would be more concerned about spontaneous combustion in the panel, than, say, earlier in the life of the panel?-- The life of the panel was extremely short.

That may be so, but at this stage when you get a report of strong benzeney - sorry, a benzeney No 4 type smell, you say that they are the only actions you took. Did you really at the time think that that was sufficient to investigate - a report of that kind from an experienced deputy?-- At that time - at that time I - that's the actions I took.

Now, Mr Caddell says that, in fact, he rang you at about 5 p.m. in the course of his shift?-- I can't remember that phone call at all.

And that he told you that he had found 10 ppm CO and a strong tar smell at 10 cross-cut. Now, what do you say to that?-- I can't remember him saying that at all.

Are you saying that it didn't happen?-- No, no, I'm not saying that he didn't make a phone call, but I can't remember that phone call at all.

Well, it is the sort of thing that would stand right out in your memory, wouldn't it - a strong tar smell at 10 cross-cut, together with 10 ppm CO? Isn't that the sort of thing that would stand out in your memory?-- You would think so, but I can't remember it.

He also says that he said to you that in his opinion the section should be sealed as soon as possible. Did that happen?-- Mick was a very expressive deputy. If he had a concern he would front me and he would be showing signs of that concern. When I walked into the deputies' cabin, if he did make that phone call, and I'm not saying he didn't, but if he had a concern, he would have raised it to me in no uncertain terms, because Mick and I got on very well, but he has been on the union executive before and he is not afraid of undermanagers and he would have done a fair bit of yelling and gesticulation to draw my attention to it. I didn't receive anything from that - and I'm not saying my actions are correct in just using body language as a sign of concern, but it was not apparent.

Well, of course, he says that he did front you with it because he rang you at 5 o'clock in the afternoon, told you about it, told you that in his opinion the section should be sealed as soon as possible, and, in fact - in fact, he says that you replied that you had talked to George Mason. Now, do you remember saying that to him?-- No, I can't remember any of that conversation.

Could this have happened and you are just not remembering it now? I mean, could it have happened and you have no recollection of it?-- I have already stated that he could have made that phone call, but I just cannot remember it.

Okay. Now, you say that at the end of your shift it is your practice to read the deputy's report?-- Yes.

Can the witness see Exhibit 81, Your Worship? That's report number 3774, the Friday afternoon shift, 5 August 1994, filled out by Mr Caddell, and you will see in respect of the first inspection that he notes there, first of all, the inspection commenced at 3 p.m. and he says that - he records that at number 10 cross-cut there were 10 ppm CO; do you see that?-- Yes, I see that.

And you will see that in the comments in relation to that inspection - not the second inspection, but the first inspection?-- Yes.

He says, "An inspection in company with Craig O'Brien was made of the top return to 13 cross-cut. A strong tar smell was evident at 10 cross-cut with the above readings taken. Time inspection completed: 6.15 p.m."?-- Yes, I see that.

Now, first of all, the time at which he appears to have made those observations would be consistent with his ringing you in the afternoon?-- It's possible, because Mick was still on the surface with me at 20 past 4. I went down underground at approximately 20 to 6 and, so, yes, it is possible that he could have made that phone call.

And, secondly, you will notice that what he puts into that report for the first inspection is in these terms: "A strong tar smell was evident at 10 cross-cut." Are you sure that they are not the words that he used to you that night - "a strong tar smell"?-- No, he used benzeney No 4 smell.

Did you see this deputy's report?-- I believe I would have seen it because Mick was - he is pretty prudent when it comes to handing reports in.

When you saw the report, would you have read it?-- That's what puzzles me. I really can't answer "yes" or "no". I know that I would have looked at the first inspection and second inspection thing - looking for the gas readings, but I can't answer for sure positively whether I would have read the general comments with it.

In terms of danger in the mine, this report is really - it is dynamite stuff, isn't it - an experienced deputy reporting that he found a strong tar smell was evident within a panel that - of the kind that 512 was at that stage? I mean, it would shake you to your foundations, wouldn't it, if you are an undermanager and you read that an experienced deputy had smelled a strong tar smell?-- I think I have already explained that the CO reading of 7 - and he has got here 8 - is no different to what day shift had reported - a difference of 1; that the deputy was not familiar with the 512 waste smell; the fact that we threw rubbish in the waste, grease drums in the waste and everything else, which can change smells-----

Yes, go on?-- -----means that on this occasion I didn't fully take in maybe everything that he was giving to me.

What about the 10 ppm?-- The 10 ppm really I would have explained simply by the fact that he told me that when he had gone through and picked - done his reading at this particular stopping it had a hole in it, and so the 10 ppm wasn't in the return, it was in the cross-cut, and due to the reduced flow I would expect 10 parts. I would expect if he would have walked in the waste there he would have got 10 parts.

After you saw the report, if in fact you did see it and you say you could well have done so, did you take any further action in relation to this?-- No, except that I passed the information on to the deputy on night shift - beg your pardon, I told Mick to keep an eye on the 512 on night shift.

That might be an appropriate point.

WARDEN: Okay. Thank you, Mr Clair. Thank you, gentlemen. Can we adjourn until tomorrow, 9.15?

THE COURT ADJOURNED AT 5.01 P.M. UNTIL 9.15 A.M. THE FOLLOWING DAY