

A M Hennessy, Coroner

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An Inquest was held into the death of Shane William DAVIS in Mackay and Rockhampton from 15th May 2006, concluding on 15th December 2006. Mr Davis was aged 29 years at the time of his death on 7/8/05.

Introduction

Mr Davis was employed as a truck driver by Korn Mining Services at the Foxleigh Mine near Middlesbrough in Central Queensland. He had been employed by the company for 21 months as a truck driver, hauling coal from the Foxleigh mine site to the German Creek wash plant.

On the 7th August, 2005, Mr Davis was working a day shift when he noticed that one of the tyres on the vehicle he was driving was "doughy". He went to the Korn workshop at the Foxleigh Mine site to attend to the tyre. Whilst a tyre fitter was employed at the workshop on a part time basis, it was the duty of the truck drivers to remove wheel assemblies with defective or damaged tyres from the vehicle, leave them to be attended to by the tyre fitter and replace the assembly with another. Mr Davis was attending to this task when the drive wheel rim assembly he was handling gave way under pressure due to a wear crack in the rim. Mr Davis had not deflated the tyres on the wheel assembly. The tyre on the outer rim was forced from the assembly and it and parts of the rim struck Mr Davis, throwing him away from the vehicle. He was immediately attended to by workmates and medical attention was sought. He suffered serious injuries which proved to be fatal.

These findings seek to explain, as far as possible, how the accident occurred. As a result of the evidence in this matter, changes to industry practice may be recommended with a view to reducing the likelihood of a similar incident occurring in future.

The Coroner's jurisdiction

The coronial jurisdiction was enlivened in this case due to the death of Mr Davis falling within the category of "*a violent or otherwise unnatural death*" under the terms of s8(3)(b) of the Act. The matter was reported to a coroner in Mackay pursuant to s7(3) of the Act. A coroner has jurisdiction to investigate the death under Section 11(2), to inquire into the cause and the circumstances of a reportable death and an inquest can be held pursuant to s28.

A coroner is required under s45(2) of the Act when investigating a death, to find, if possible:-

- the identity of the deceased,
- how, when and where the death occurred, and
- what caused the death.

An Inquest is an inquiry into the death of a person and findings in relation to each of the matters referred to in section 24 are delivered by the Coroner. The focus of an Inquest is on discovering what happened, informing the family and the public as to how the death occurred, but not on attributing blame or liability to any particular person or entity.

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The coroner also has a responsibility to examine the evidence with a view to reducing the likelihood of similar deaths. Section 46(1) of the Act, authorises a coroner to “comment on anything connected with a death investigated at an inquest that relates to – (c) ways to prevent deaths from happening in similar circumstances in the future.” Further, the Act prohibits findings or comments including any statement that a person is guilty of an offence or civilly liable for something.

Due to the proceedings in a Coroner’s court being by way of inquiry rather than trial, and being focused on fact finding rather than attributing guilt, the Act provides that the Court may inform itself in any appropriate way (section 37) and is not bound by the rules of evidence. The civil standard of proof, the balance of probabilities, is applied. All interested parties can be given leave to appear, examine witnesses and be heard in relation to the issues in order to ensure compliance with the rules of natural justice. In this matter, the Mine, SSE, Employer, Union, family of the deceased and other interested parties were represented at the Inquest.

The Investigation

The incident was reported to Inspection Officer Mahesh Dahal of the Mines Inspectorate and the Senior Site Executive (SSE) was instructed to cordon off the accident site. Inspectors Herbert and Smith were notified. Inspector Smith and Mr Dahal proceeded to the site upon learning of the death of Mr Davis. The Queensland Police satisfied themselves that there were no suspicious circumstances and secured the scene for the Mining Inspectors. A thorough investigation of the scene and witness interviews took place over the following days and weeks.

The report prepared by Inspector Smith detailed particulars of Foxleigh operations. Foxleigh Mine is an open cut coal mine near Middlemount in the Bowen Basin in Central Queensland, producing around 4 million tonnes of coal per year. Foxleigh employed 238 employees at the time of the incident. Mr Ian Brown was the SSE in August 2005. Foxleigh is a smallish mine and relies on contractors on a continuing basis in order to conduct the mining operations. Korn Mining Services, who employed Mr Davis, were contracted to haul coal from stockpiles to German Creek Mine for processing prior to transport to port. They also operated haulage contracts on other mine sites in the Bowen Basin. At Foxleigh, the Project Manager, Mr Peter Reggardo, was the senior Korn employee on site and had responsibility for Korn safety management in the Foxleigh organisational structure.

An Incident Causal Analysis Method (ICAM) investigation was conducted on the incident. That investigation found that the lack of identification of the hazard of uncontrolled release of stored energy from the tyre, the lack of a physical barrier between the wheel and worker, the removal of physical barriers (cleats) whilst the tyre was still under pressure, and the failure to deflate the tyres were major contributors to the incident. It was also noted that there was no evidence of the truck drivers being exposed to safety information relating to the handling of multi-piece rims. Inspector Smith’s investigation revealed that a training needs analysis (required under Regulation 82) had been done but there had been no identification of a need for training on removal of wheels in the mining setting.

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There had been a similar incident (albeit regarding much larger machinery) at the Century Zinc Mine in Queensland on the 9th February 2004 relating to the death of Peter Marshall. The Department issued a Safety Alert to the industry following this incident. Access was not made to safety alerts or information on the website of the rim manufacturer.

Inspector Smith presented a very thorough and informative report to the Court concerning the incident, including a video simulation of the assembly of the multi-piece rim and the probable sequence of events when the wheel assembly gave way. I am satisfied that the investigation was carried out in an appropriate, professional and thorough manner and the information gathered was of critical importance to the Inquest.

The Evidence

I have summarised only those portions of the evidence I consider necessary to explain the findings and recommendations I will make. I have taken all of the evidence before me into account in considering this matter, even if it is not specifically referred to.

On 7th August 2005, Mr Davis commenced day shift and took over driving Truck 46, a B-double Kenworth C510 Coal Hauler also known as a "Big Foot", from Anthony McCarthy, the nightshift driver. Mr McCarthy reported no safety issues with the vehicle, having conducted about 4 safety inspections of the truck during the shift. The truck known as a Big Foot is a vehicle which cannot be registered on Queensland roads due to its configuration (larger than a prime mover). It is more than a standard road transport vehicle.

On his 7th run to German Creek carrying coal, Mr Davis informed his supervisor, Clyde Davis (also his uncle), that he had doughy tyres (low pressure) and would need to change them. He drove the truck into the right hand bay of the Korn workshop. The crib room was beside the workshop and Mr Jeppesen and Mr Schiekowski were working in the other bay of the workshop. Mr Davis also informed Mr Jeppesen of his intention to change a doughy tyre.

Mr Davis placed a hydraulic jack under the truck to lift the drive wheels from the concrete floor of the workshop. He used a rattle gun to loosen some of the cleats on the wheel. His workmates heard the operation of the compressor-driven tool but could not see Mr Davis. During the use of the rattle gun, a loud sound like an explosion was heard by his workmates.

The men went immediately to investigate and found Mr Davis with a serious head injury. He was unconscious but breathing. Pressure was applied to the wound and emergency services were immediately notified. Mr Davis had been thrown back near the water truck from the impact.

Unknown to Mr Davis, the inner wheel rim had cracked and separated from the ring groove, allowing movement in the components of the multi-piece rim. As the tyres on the dual assembly were still inflated when Mr Davis commenced loosening the cleats,

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the components of the rim gave way, allowing the explosive release of pressure from the tyre. Only some of the cleats had been removed but the release of pressure sheared six of the wheel studs and bent four others. All of the components and the 2 tyres were expelled from the wheel assembly onto Mr Davis and into the surrounding space with immense force. The rattle gun was also found in close vicinity to Mr Davis.

The Open Cut Examiner, Mr Anthony, attended the scene quickly and rendered assistance to Mr Davis. He gave evidence that whilst Mr Davis did not regain consciousness, he seemed to respond to a question by squeezing Mr Anthony's hand and muttered some words. The Middlemount Ambulance attended and took Mr Davis from the scene towards the airport to meet with a medical evacuation aircraft. A doctor met the ambulance in transit. Mr Davis died before the airlift.

Sgt Blain of Middlemount Police attended the scene and handed over to the Inspectorate after ascertaining that there were no suspicious circumstances requiring Police investigation. In his evidence, the Sgt commended Korn management and employees for the manner in which they secured the scene and stated that all Korn and Foxleigh personnel were very co-operative with Police on the day in question.

Autopsy Results

An autopsy was conducted by Dr Fitzpatrick in Mackay. The examination revealed that Mr Davis suffered a large jagged laceration to his forehead and extensive skull fractures with displacement and exposure of the brain. There was also a peppering of small abrasions to his head area and a jagged laceration to his left knee. The pathologist's view was that Mr Davis died from multiple injuries due to the workplace accident. There was no evidence of alcohol or drugs in Mr Davis's system at the time of the incident. Dr Fitzpatrick stated that the injury sustained by Mr Davis caused very, very severe brain damage, that he was unconscious quickly and that it would have been a quick passing.

Development of Korn Bulk Haulage as a Business

Mr Des Korn had been involved in transport trucks for 30 years and his father before him. He started Korn Bulk Haulage at Dysart (with 1 truck) carting gravel for 16 years. He obtained a contract at Ensham Mine in 1991 where he was working 6 trucks in coal haulage. He ended up taking over all of the coal haulage at that site and was operating 15 trucks. He worked under the mining operator's Safety Management System (hereinafter referred to as the Plan or SMS). He was then approached by Theiss at Collinsville to cart coal onto and off site and entered into a 4 year contract between 2000 and 2004. He was approached by BMA Blackwater to do a couple of weeks work which continued for 5-6 years until 2006. He was also approached by Theiss to tender against Brambles at Oaky Creek and a few weeks later Foxleigh came on board. He had 30 trucks by then and described his business as doubling overnight. At that time, he realised that his wife and he would no longer cope with running the business on their own.

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At each site, he used the mining operator's procedures. He said that the mines knew that they were a small operation but around the time of taking over the Foxleigh contract from Mackenzie River Bulk Haulage, BMA told Korn that he was big enough to have his own system in place and so they started to develop one. He employed a Safety consultant to commence that process.

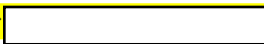




He hired experienced employees to assist in the running of the business and worked on the basis of trusting in their knowledge and experience. Getting experienced and qualified people was not easy. Mr Korn's reliance on documents such as contracts was not strong and he managed business relationships on a handshake and trust. He sorted out problems as he got the job done. He approached the coal hauling as just hauling in a different setting.

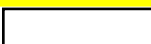
David Rix commenced with the company in May 2003 as General Manager. Mr Korn had health issues at that time and was becoming more involved in the maintenance side of the business, whilst Mr Rix attended to the business side.

Mr Korn stated in evidence that in all his years in the trucking industry, he had never deflated tyres when removing wheels and he never expected the danger of explosion of the tyre. He stated that he always had a good safety record, continually looked to upgrading and considered himself to be proactive. His company motto was Safety, Management, Production. He said he was never concerned about the cost when safety was involved.

Korn Management Issues

The Korn Shift Supervisors who gave evidence, including Mr Clyde Davis, stated that they had achieved the required supervisor qualifications for the mining industry but received no training beyond that. They were not given instruction on the SMS, were not trained or assessed as competent against the SOPs, were not trained in hazard identification or risk assessments or on how to train or assess competence of the workers in a formal sense.  the pressure of other duties, they did not usually attend the SOP reviews with workers. Their day-to-day activities included driving around site checking on progress, relieving for drivers who were ill or not at work, checking in at the workshop and generally lending a hand where needed. They reported to Mr Reggardo.

Mr Reggardo was the Project Manager for  at the time of the incident. He was therefore the senior  person on site and had obligations under the  safety management structure and Safety Management System. He  admitted in his evidence that he had not familiarised himself with the contract with  nor the Coal Safety and Health Management Act 1999 provisions. He explained that this was due to difficulties he encountered with reading such documents. He had not made higher levels of management aware of this issue.

He stated that he had no training in relation to the safety obligations attaching to his position other than the supervisor competencies. He was not provided with a list of his responsibilities under the SMS. This situation combined with Mr 

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difficulties with formal documents meant he was never in a position to fulfil his obligations effectively.

Mr Reggardo gave evidence that he conducted work area inspections to identify hazards, such as tripping hazards. He saw the tasks undertaken in the company as low risk. The only review he conducted of the workers' knowledge of SOPs after their initial induction was reviews of SOPs on wet days. **Safety meetings were held as informal and brief shift change/toolbox meetings each day. No records were kept of those meetings.** Mr Reggardo said that the Foxleigh Contract manager checked on those meetings and was satisfied with them.

Mr O'Dwyer was the next in the chain of command above Mr Reggardo at Korns. He had previous mining experience as a truck driver since 1995. He became Area Manager of Korns in 2000. He maintained contact with the Project Managers on each site, including Mr Reggardo at Foxleigh, in his words, his duties were to help with the day to day running of jobs. Despite his position, he was unaware of the terms of the contract with Foxleigh or of Korn's responsibilities under the contract. Any contact he had with Foxleigh related to haulage production targets. He did not attend safety meetings with Foxleigh, they were usually attended by Mr Reggardo.

Mr O'Dwyer answered to the General Manager for Korn Bulk Haulage, Mr Rix. Mr Rix came to the company with business experience, holding a degree and post graduate Certificate in Business Management as well as a trade qualification of Fitting and Turning. He managed all aspects of the business and answered to the owner, Mr Korn. Mr Rix was responsible for contractual and pricing matters.

Mr Rix gave evidence that Mr O'Dwyer's description of his role was incorrect and that his duty actually was to oversee the management of all operations and ensure they were running smoothly in consultation with the project managers. Mr O'Dwyer, when recalled to give further evidence, seemed to have a much clearer understanding of his role. He put his earlier vagueness down to nerves. His further statement of duties included liaising with project managers, talking to clients on issues relating to haulage, ordering tyres and dealing with mechanical and plant issues and helping the project managers run the sites.

Mr Korn, by the time Mr Rix came to the company, assisted with maintenance issues and liaised on issues of maintenance with the maintenance manager and attended to purchasing and selling of machinery and equipment. He was not involved in the day-to-day operations of the company.

Qualifications and Inductions for Truck drivers

Employees of Korn who were driving trucks, including the Big Foots, were required to have an MC drivers' licence (road trains), have obtained a Black Coal Competency (3 days), underwent Foxleigh (6 hours) and CapCoal inductions to work on the Foxleigh and German Creek sites, and had a Korn induction. Mr Reggardo, the Project Manager for Korn Bulk Haulage, gave evidence that there was not really a Korn induction as such – the workers went through the Korn SOPs, which included one for removal of rims from vehicles (for bolt on/bolt off not multi-piece rims).

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Driving capability was assessed by Korn supervisors over varying periods of time depending on the experience of the worker but maintenance issues including wheel changing was not assessed.

Mr Schiekowski, an employee of Korns, was concerned that the inductions are done quite quickly and that more time could be taken to allow workers to digest the information being presented. He felt the time pressure in the inductions meant that he was multi-tasking and not retaining a lot of information, and that he was provided with no reference material to take away with him. He was uncomfortable with that method of teaching and felt that a lot of the other attendees were too. He advised that workers were not given the opportunity to hold onto a copy of the SOPs or other procedures and there was no central book of them to which the workers had access. Whilst there was a copy of information in the Foxleigh training room, he said that the Korn workers had little or no occasion to go there. He was unaware of the copy in the Korn crib room.

Mr McCarthy, a truck driver with Korns, underwent a general black coal induction in Rockhampton for 2 days, and a general site induction at both mine sites (Foxleigh and German Creek) of 1 day each. He went through the Korn SOPs with Mr Reggardo the following day. He stated that at that stage he was lost due to the amount of information being presented over the couple of days and that the inductions gave some awareness of the issues but not a total understanding. He stated that most of the information was repetitive between the inductions and there was a risk of not fully understanding the information as it was all mulched in together. He said that at the time of starting with Korn he did not have a clue what was going on and that early on it was very confusing and a completely different world to the workplaces he was used to, things were happening thick and fast and it would take anyone a long time in his opinion to become 100% comfortable in the workplace. His driving skills were assessed on the job over a 2 day period by Korn supervisors.

Despite his previous experience, he had never heard of deflating tyres before wheel removal but he did become aware of that information on site at some time. He was unable to specify when. He said that stored energy was covered in the generic induction in a general sense.

All of the drivers had experience in the road transport industry or with trucks in general. Their previous experience was relied upon in relation to maintenance issues and their competence was not assessed in that regard. They were given no instruction on maintenance tasks.

Duties of Drivers at Korn

Mr Davis' duties included driving Kenworth C510 Coal Haulage trucks known as "Big Fooks" hauling coal from the Foxleigh ROM (Run of Mine) stockpiles to the Wash Plant at German Creek Mine, neighbouring the Foxleigh operation. The distance of that journey was about 20-25 kms in each direction and the vehicles were operated 24 hours a day in 2 shifts, 7 days a week. There were 4 truck-drivers per shift. Other road train vehicles were used in addition to the Big Fooks to haul the coal on site.

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Drivers were responsible for minor repairs on the trucks (not requiring the maintenance crew) and changing wheels was part of the driver's general duties. The drivers conducted pre-start checks on the truck at the commencement of each shift. During the shift, they would check tyre pressure again and make visual and tap inspections of the tyres for damage. Mr McCarthy indicated that he attended to this after every 2 loads or so.

Gary Ballard was a subcontractor for Korn's, providing a truck (a Kenworth but not a Big Foot) and his services driving it, carting coal. He was also a very experienced truck driver, having 30 plus years in the industry, but was unaware of the deflation of tyres issue. He had never thought there was any safety issue in this regard and had used split rims over the years without problems. He did not look into Korn's SOPs for changing tyres as his wheels were of a different type and he took his own spares on site and attended to changing them himself, usually in town.

Mr McCarthy was also a truck driver for Korns. He had years of previous experience in the Australian Army and the road transport industry. He had worked with some small multi-piece rims but his experience was mostly with single-piece rims.

Supervision and Training of Drivers

It was suggested to Inspector Smith in evidence that there may be an ill fit between road transport industry operations and mining competencies. The evidence generally disclosed a tension between the road transport industry culture and the particular application of the use of road transport vehicles in a coal mining setting, including the significant differences in loads, the risks around coal mines, additional corrosion to parts occasioned by exposure to coal etc.

Mr Schiekowski, who commenced work with Korns in December 2004, indicated that there was no training on the Korn Safety Management System or the SOPs and that he was effectively left to his own experience and discretion on the job. He had 16 years experience in driving trucks but had no understanding of the hazards relating to tyres and had no prior experience with these rims or split rims in general. He had never been aware of deflation of tyres until this incident. He stated that deflating both tyres on a dual assembly takes little extra effort, is a simple task and does not take a lot of time.

He said that the safety meetings were usually quick discussions at the shift changes and safety issues were not regularly addressed. Mr Reggardo would discuss safety information about once a week on an ad hoc basis but that the supervisors were always available to discuss issues that arose and provide advice. His experience since leaving the Foxleigh site (he is now at Oaky Creek) is a significant change in the safety culture with twice weekly toolbox meetings.

Mr Jeppesen, a Diesel Fitter, was aware that the drivers had no training in tyre removal and he was not himself aware of the hazard of stored energy in tyres prior to the incident. He frequently saw drivers removing tyres as part of their duties and it was not a practice at Korns to deflate tyres. He had no training in the SMS or SOPs.

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He was not encouraged to access the SOPs as it was felt he had sufficient experience. It was not his practice to do a JSA before completing a new task. He stated that he often assisted drivers to remove rims as their weight and size made them too big to handle alone.

Mr Clyde Davis was the Shift Supervisor on duty on the day in question. No safety issues regarding the task of tyre changing were discussed with Mr Shane Davis prior to him undertaking the task. It would seem that the task was considered so routine that an experienced driver would be expected to undertake the task safely. Mr C Davis, nor any of the drivers who the Court heard from, used the procedure of deflating tyres before removal. Evidence was given that most of the employees of Korn had previously worked in the road transport industry and deflation prior to rim removal from the wheel was not a practice in that industry. The evidence was that it would have been a relatively quick and easy task to deflate the tyre in the workshop prior to removal if there had been a wish to do so.

Vehicle Maintenance Issues

Korn operated a system for reporting of vehicle defects and safety issues to management for attention. Drivers were required to complete a *Korn Plant Safety Checklist and Defect* form by filling out the details at the commencement of shift and signing off on form at the completion of the shift when the form was provided to the Shift Supervisor. Despite there being a provision for the Shift Supervisor to sign off on the form, that was not the practice adopted within Korns at Foxleigh. The forms were then placed in a mailbox for collection and action by Mr Reggardo. Depending on Mr Reggardo's shifts, it could be a number of days before the forms are actioned. Mr Jeppesen advised that there were delays with Reggardo's processing of the forms of up to 2 weeks.

Urgent maintenance issues were referred directly to the supervisor for immediate attention. Most of the time, those issues were communicated through verbal reports to the mechanics and were not recorded or tracked.

Vehicle servicing took place on the basis that the workshop was allocated a vehicle to service on a particular day. One vehicle would be serviced at a time. If a service was unable to be completed in a shift, the vehicle would be returned to work (if there were no serious faults) with the service to be completed at another time. Mr Jeppesen was one of the diesel fitters responsible for the 200 and 1000 hour services of the trucks. A 200 hour service was described as taking about 6-8 hours to complete. Vehicles were also briefly inspected when otherwise in the workshop. Mr Rix, the then General Manager, advised that services were recommended by the vehicle manufacturer to be carried out every 250 hours of operation but due to the mining application, Korns adopted a conservative approach and conducted the services every 200 hours.

In relation to Truck 46, a 200 hour service was conducted on the 5th August 2005 but not completed. The service documents noted that the vehicle needed new drive tyres. They were not fitted during the service. Mr Reggardo surmised that the reason for

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this was that the 5th was on the weekend and it was probably a matter that could wait until the Monday when the tyre fitter was available.

The Safety Checklist forms for Truck 46 in the days leading up to the incident noted various defects or matters requiring attention including faulty tyres and wheel nuts. Mr Reggardo had significant difficulty in being able to identify what the problems noted on the form actually referred to given that the information was so non-specific. Certainly, a seriousness of the defect could not be determined from the face of the form. Mr Reggardo's comment was that as long as the vehicle was not going to fall apart, it would be sent back out to work. Mr Atkinson, one of the drivers, stated in evidence that there were differing opinions amongst drivers as to faults especially relating to tyres and that the information recorded on the forms was not objective or to any particular standard. In any event, their assessment could be overruled by a supervisor of a different opinion.

Mr Jeppesen gave evidence that Mr Reggardo would inform him verbally of what needed doing to what truck. The trucks would be rotated in and out of the workshop in order to keep as many vehicles as possible on the haul road. Depending on the seriousness of the defect, the vehicle would come to the workshop when it had time.

Hazard of Uncontrolled Release of Stored Energy

The hazard of the uncontrolled release of stored energy from tyres has existed for many years in the road transport industry. Deflation of tyres prior to the removal of wheels from road transport vehicles is still not mandated in that industry at present. There was varying evidence as to the extent of use of multi-piece rims in that industry. It seems that the Big Foot vehicles, whilst registrable for road use in Western Australia, are not in Queensland and would not be used in that context here.

In Western Australia the hazard has been formally identified. In February 2005, the Department of Industry and Resources, Safety and Health Division, published a guideline regarding *Tyre Safety, Fires and Explosions*. It is noted on page 4 in section 3.3 that "*Divided wheels, split-rim and locking ring wheel and tyre assemblies are especially likely to explode if poorly maintained, incorrectly fitted, or if assembled or disassembled while inflated....It is essential to deflate tyres before wheel removal to ensure that removing the wrong nuts does not result in a serious or fatal accident*". The Guideline was directed to "everyone handling tyres and those with a duty to prevent injuries when working with tyres" but was distributed under the *Mines Safety and Inspection Act 1994 (WA)*.

Deflation of Tyres

A tyre and rim assembly has been described in the evidence as a pressure vessel which stores energy. Releasing the energy prior to working on the assembly to avoid potential harm from the uncontrolled release of that energy was essential for safety in these circumstances.

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Mr Mann, Tyre Fitter, and Mr Krajewski of Rimex both gave evidence that tyre fitters are trained to deflate tyres in a multi-piece rim assembly before removal from the rim and in the hazards of stored energy generally.

Mr Mann was employed by Beaurepairs as a Tyre Fitter and worked at Foxleigh under an agreement between Korn and Beaurepairs 2 days per week. He worked at Korn workshops on other sites for the balance of the week. His duties included replacing tyres on rims which were removed and left in the tyre bay. He had to maintain the tyre racks with usable tyres on rims for replacement on vehicles, visually inspect trucks for tyre defects and do pressure checks on tyres on vehicles on a regular basis. He gave evidence that there was no recording of any particulars of rims or tyres by Korn. Mr Reggardo confirmed that Mr Mann was not required to do any testing or checking of rims beyond a visual inspection at the time of tyre changes.

He removed rims or assisted in their removal from vehicles on about 6 occasions per week. He cleaned the rims with a wire buff and visually checked them for cracks or damage, replacing about 30-35 tyres per week. He described his workload as flat out and said at times he struggled to keep up. His role did not include providing advice to Korn on any matters or giving any direction to Korn staff, he was purely there to maintain the tyres. He would regularly receive reports of doughy and partly deflated tyres and see punctures, leaking valves and leaking o-rings. Mr Reggardo estimated that 10-15 tyres per week were replaced, most of which were trailer wheels.

He described the average life span of a tyre on the Big Foots to be about 4 months, with the rim being inspected at every tyre change.

In the event of a visual crack being detected the rims were discarded for inspection by Korn management and replacement at their discretion. A couple of rims would be discarded per month with Korn management ordering replacements.

Mr Mann stated that he knew to deflate both tyres on a dual assembly before working on them, which task took about 5-10 minutes. Sometimes drivers would assist him and he conceded that drivers may have seen him removing rims from vehicles without deflating tyres. He did not deflate tyres about half of the time, due primarily to the pressure he felt from some of the truck drivers to get the job done quickly so they could get moving again. The commercial imperative for the company was to haul as much coal as it could in order to earn the most income, it was in the company's interest to have the trucks on the road for the maximum amount of time possible. In contrast, drivers were not paid any bonuses or commissions on their haulage rates so there would seem to have been no financial pressure on them to stay online.

He gave evidence that Korn drivers had discussed the issue of deflated tyres in general conversation on numerous occasions, but in the context of not fully inflating tyres to be placed in the go rack. There was also discussion along the lines that he, as Tyre Fitter, should be doing all the tyre work, including removal from vehicles. He gave evidence of a conversation he had with Peter Reggardo in which he asked why the tyres left for him to work on were not being deflated prior to removal from the vehicles. His evidence was that Reggardo told him it was to make his job easier and

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quicker for him (an inflated tyre being easier to manoeuvre on the ground). Mr Reggardo denied this conversation.

Mr Jeppesen stated that it was not a practice at Korns to deflate tyres before rim removal from vehicles as the tyres became too hard to handle when they were soft. He said that Mr Mann did advise him a couple of months before this incident, to deflate to about 20/30 psi but he did not have occasion to remove a tyre after that time. He had decided that he would not follow that advice due to the difficulty in handling. He said Mr Mann did not mention any risk of explosion in relation of deflation.

Mr Reggardo surprised all in the Inquest when he revealed that he was aware of the issue of deflation prior to the incident and had in fact instructed some of the truck drivers to always deflate tyres before removal of rims from vehicles. He stated that it took only 5/10 minutes to deflate the tyres and that the time issue was not critical from an operational point of view. He stated that he raised this warning in early 2005, having become aware of it in his previous position at another site in about November 2004. He stated that he did not conduct inspections to ensure that the drivers were complying with his instruction and that he could not be sure that he had informed all of the drivers, but felt that most of the Big Foot drivers would have been told, including the deceased. He stated that he had informed Mr McCarthy to deflate to 20 psi, the same level as the tyres in the go rack.

He also indicated that he fed that information into the review of Korn's SMS and went as far to say that he informed the reviewers that he had been verbally telling the men to deflate tyres and that was already happening. Shift supervisors reported that there was not any information given to them regarding deflation by Mr Reggardo or in their presence. Both Mr O'Dwyer and Mr Rix were surprised by the evidence of Mr Reggardo that he had made this information known as they said they had not heard of that until it was said in Court.

Mr Reggardo's evidence in this regard flies in the face of the evidence from the supervisors, managers and workers at Korns and must be treated as extremely suspect and self-serving.

Very few of the witnesses were aware of the incident at Century Mine which took the life of Peter Marshall in a situation where there was an explosive release of pressure from a tyre on a dump truck. Whilst that incident related to earthmoving machinery, the hazard was the same as the one in the present case. A Safety Alert had been issued by the Inspectorate following the incident. Despite the evidence suggesting that Safety Alerts were at least placed on crib room notice boards and went to Korns, little attention seems to have been paid to this incident.

Mr O'Dwyer said that he was aware of the incident but had no concern regarding it as it related to earthmoving equipment which Korns were not involved with. There does not seem to have been any appreciation of the application of that hazard to the vehicles Korns were operating.

The Rim

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The rim involved in this matter was produced by Rimex in Canada in February 2001. Rimex supply heavy duty rims to the earthmoving industry, with the mining industry making up most of the wholesale market. They do not sell rims directly in the retail market. There are about 3 rim manufacturers in the Australian market. The style of rim was MES-T and is a five piece rim assembly. It is said to be quite different to rims regularly used in the road transport industry in Queensland.

It is likely that the rim was sold by the Perth branch of Rimex to Kenworth for fitting to vehicles during manufacture. The rim was not sold directly to Korn. The manufacturer does not (and is not easily able to) keep track of the users of the rims. For instance in this case, the Kenworth vehicle was supplied at some stage to Mackenzie River Bulk Haulage, who later operated in Qld, and then to Korns who were themselves unaware of the brand of rims on the vehicles they acquired second-hand.

There was evidence from Mr Krajewski of Rimex that the life span of the rims under normal operating circumstances would be in the area of 2 years. Normal operating life was said to depend on the conditions of operation including the driving surface, turning circles, air pressure maintenance, the speed at which the vehicle is being driven, maintenance and cleaning of rim, wheels being torqued up properly, studs and nuts being maintained in good condition, and operating hours. Coal haulage on mine sites was said to be a harsh application. In harsh conditions, the life of the rim may be in the vicinity of 6 months and up to 2 years in good conditions. They are covered by a warranty of 12 months. The warranty documents are the only documents speaking of longevity of the rims and this information is not available on the website.

Most of the employees of Korn who gave evidence, even those with some previous experience of multi-piece rims, were not aware of any separate safety issues relating to multi-piece rims over single piece rims. They were not instructed in relation to any different handling techniques that they should adopt in relation to such rims or of the importance of deflation of tyres on the rims. The only risk of uncontrolled released of pressure they seemed to be aware of was in connection with inflation of tyres after fitting.

Mr O'Dwyer gave evidence that Korns had no system in place regarding procedures for rims and tyres, no rim register or monitoring of rims, no inspection or testing regime and no system for assessing competence of workers in maintenance issues. He organised the purchase of new tyres and rims.

It seems, however, that there was a system of a sort in place in the Korn operations at Blackwater mine. A rim register was kept and some non-destructive testing was undertaken through Beaurepairs in Emerald on heavy earthmoving rims and some Big Foot rims (24 inch diameter and above). On that site, Klinge and Company conducted an audit of all contractors in relation to tyres and rims on behalf of BMA. As a result of that report (Exhibit 30), Korns did action some of the recommendations and commence some rim management strategies. Mr Rix maintained in evidence that the Klinge audit related only to earthmoving equipment but the report clearly indicates

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this is not the case. Further, some of Mr Rix's notations on the report would seem to support this proposition. Some of the issues noted by Mr Rix were not implemented. He was unsure why all of the recommendations were not implemented but thought that it was likely due to BMA not following the matters up with them.

Rimex maintain a website with open use to the public. The website contains safety and general information regarding the products. This facility was available prior to the incident. Exhibit 12, a video on rim maintenance, included information on complete deflation of tyres prior to working on the assembly, the need for inspection for wear and replacement, and the need for, amongst other tools, a pneumatic torque wrench to be used instead of a rattle gun to ensure accurate torque in fitting of the rim and tyre assembly to the vehicle.

The evidence disclosed that an important element of rim maintenance is record keeping. Such records should include having the available information accessible regarding the position of the rim (identified by number) on the vehicle, and regular inspections (per a certain amount of hours use). Non-destructive testing is far superior to visual inspection and allows minute cracks or faults to be detected at an early stage. Magnetic Particle Testing is a form of non-destructive testing and was described by Mr Krajewski as world's best practice in rim maintenance. The Australian Standard 4457 includes reference to such testing. There are moves for the testing to be included in international standards.

Mr Reggardo, the person at Korns responsible with Mr O'Dwyer, for the decision to replace rims, was not aware of the availability of non-destructive testing on rim assemblies. He was also unaware of the need for regular inspection of rims. There was no rim register, identification or marking of rims in service or records of the length of service of rims at Korns. He stated that when new rims were supplied, they did not have any accompanying information, warranties or safety warnings. Mr O'Dwyer stated further that Beaurepaires did not suggest that visual inspection of the rims was not sufficient and there was never a suggestion or recommendation regarding crack testing or preventative maintenance. Mr Korn gave evidence that he had only been aware of crack testing in the context of earthmoving equipment.

Mr O'Dwyer was generally aware of the availability of non-destructive or crack testing in relation to steel structures but said that it had never occurred to him to have a systematic inspection process including such testing for rims. The approach was simply that when they wore out or were damaged, they were replaced. He had never investigated what rims were being used by the company and when replacement was being arranged, he would either source rims from Beaurepaires or another company depending on availability. There did not seem to be any preference for one brand over another.

Mr Krajewski gave evidence that the 5 piece rim costs about \$900-1000 per assembly. The cost of Magnetic Particle testing is approximately \$325 per assembly including a service of the rim.

Following the incident, Mr Brown, the SSE at the time, ordered all Korn rims to be tested. Of the 46 rims tested, 14 failed inspection (not all were Rimex rims).

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Since this incident, Rimex have increased the amount of safety information available, including safety posters. Mr Krajewski has also been involved in the development of a double gutter rim for use in this application which won a 2004 Australian Safety Award. The rim is designed so that it always stays on the hub and the tyre is able to be removed from the rim whilst the rim is still fitted to the vehicle. A tyre is not able to be removed from the assembly without being deflated.

Technical Analysis of the Rim

The rim was technically analysed by ETRS. Mr Paul Tutin prepared a report dated 25/10/05 which was tendered and he gave evidence at the Inquest. Upon analysis of the rim by ETRS, areas of corrosion and pitting in the rim were identified which are consistent with extended use of the rim. It was noted that there were multiple locations of cracking with separation occurring once the cracks joined up. The area was heavily corroded on the surface of the cracks, indicating that the cracking was happening over an extended period of time.

The ETRS report stated that the material used in the manufacture of the rims was appropriate for use; the rim had high residual stresses from manufacture; and the failure began at the bottom of the lock ring groove and was caused by high cycle, low stress metal fatigue. The failure appeared to be as a result of use of the rim over an extended time as opposed to ill-use or overloading. The crack appeared to occur over a period of time (weeks to months). There was evidence that the tyre on that wheel may have been last changed on 6/4/05, at which time, a visual inspection of the rim would have been carried out.

It was highly probable that the extended use of the rim in the harsh conditions, beyond its expected life span, would have contributed to the cracking of the rim.

Contractual Arrangement with Beaurepaires

Mr Rix gave evidence that he employed Beaurepaires to manage tyres and rims, inspect rims and provide technical assistance and advice on maintenance of tyres and rims. Korns entered an informal arrangement with Beaurepaires for the supply of tyres and the services of a tyre fitter. Mr Mann was the fitter on site at Foxleigh and worked there 2 days a week, filling in the balance of the week at other sites for Korns. The agreement with Beaurepaires was not reduced to a written document, other than for some references in the exchange of some brief correspondence as to the pricing structure for and supply of tyres. There was no arrangement for any inspection of rims according to Mr O'Dwyer. Ironically, whilst Mr O'Dwyer was unaware that rims had a particular service life, he considered it Beaurepaires' responsibility to ensure that the service lives of the rims were not exceeded.

Mr Rix gave evidence that the understanding with Mr Backer of Beaurepaires that he would visit each site once a month and conduct analysis on tyres and rims and speak to Korn staff regarding relevant matters and review the operations of the tyre fitter. He would then report back to Mr Rix on what he had found during site inspections but none of those reports or meetings were documented in any way. Mr Rix said that on

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7/10/04, Mr Backer made presentations to Korn project managers and operators on tyre failure and maintenance. Mr Rix stated that Mr Backer often gave advice on rims and related matters.

Mr Korn gave evidence that he considered Mr Backer to have good information on rims as he had assisted in having Titan re-engineer rims for a particular application for Korns. He added, however, that he did not expect to receive advice from him regarding rim maintenance.

Mr Backer had experience in the tyre industry since 1978. He was not trained in tyre fitting but had knowledge of the manufacture of tyres. He had no experience or qualification in relation to rims. He said he did not give Korns the impression that he had but would have given them his thoughts on rims from a salesman's point of view.

He gave evidence as to his role in this way – as company representative, he would check on stock on site, inspect tyres in use and scrap tyres, look at the haul roads, do some spot pressure checks on tyres in use, look at tyre life and make recommendations to O'Dwyer regarding tyre issues. He stated that he would deal with O'Dwyer in relation to all sites. His only correspondence was in relation to pricing issues.

He described the company's tyre fitter, Mr Mann, as quite competent. The Branch Manager was responsible for the tyre fitters and consequently Mr Backer was not his supervisor. Mr Backer would sometimes assist Mr Mann and whilst it was not his role to advise on safety issues, if he saw any unsafe practices being used by Mr Mann he would have told him immediately. He was aware of multi-piece rims and stated that deflation of tyres on multi-piece rim assemblies was not necessary in his experience and, further, he would not have considered it unsafe if he saw a wheel being removed without deflation.

The procedure was that Mr Mann would discard any rims which were cracked and Mr Backer did have discussions with Korns about patterns to rim wear as part of overall discussions but did not specifically monitor rim wear. He said he would discuss basic issues such as the effect the state of haul roads would have on tyres and particularly what pressure would be maintained in tyres in particular situations. He made one specific recommendation regarding the use of wedge bands, which information he had picked up from a competitor and passed on to Korns.

Safety and Health Management System

A Mine is required to have a Safety and Health Management System and Principal Hazard Management Plan under the Coal Mining Safety and Health Act 1999. The legislative requirement for such a system to be developed lies with the operator of the mine and not on individual contractors. When there is any change to the SMS, the Safety Officer for the mining operator has a responsibility to make those changes known to all on site, including contractors. A copy of the SMS is kept in the Foxleigh Training Room and Crib Rooms and on computer. Changes to such matters are discussed at pre-start meetings attended by Foxleigh staff but not usually contractors.

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A copy of the reports were placed on the Korn noticeboard. As new SOPs were developed, they were provided to Korn for inclusion in their copy of the SMS.

Foxleigh Mine's Safety and Health Management System was called the Foxleigh Integrated Management System (FIMS). The Transport Principal Management Plan was developed after a risk assessment was carried out across the Foxleigh site in 2001. A Standard Work Procedure was developed for the then transport contractor, Mackenzie River Bulk Haulage, in relation to tyre changing. No procedures in the Plan referred specifically to Korn or required review when contractors changed. There was a provision for audits every 2 years.

Generally, contractors coming onto site are required to either work under the SMS of the mine operator or to develop their own system or SOPs for tasks not included in the mine operator's SMS. Such material must be passed by the SSE of the mine as being of a similar standard to the mine operator or better.

The Foxleigh Contractor Management System requires the Foxleigh Contract Manager to provide all information relating to hazards on site, risk assessments and controls to the contractors. Mr Anthony gave evidence that a copy of the SOPs were provided to Korn for display in their area and that Job Safety observations and audits were only conducted on Korn workers to compare their work to the SOPs where they were operating similar equipment to Foxleigh. Mr Schmitt, employed in the Foxleigh workshop, gave evidence that occasionally (usually when time permitted) a random inspection would be carried out on Korn's workshop in relation to basic safety standards.

The safety culture in Korns was described by some of the employees as being good, others described a focus on production with safety second. At best, the safety arrangement such as meetings, assessments and reviews of procedures could be described as limited and ad hoc. SOP reviews only occurred on wet days when the trucks could not haul. Even then, the supervisors did not always attend those reviews. Mr O'Dwyer estimated that there were about 5-10 wet shifts in a 12 month period, commenting that not much rain was needed to pull the shift up. Mr Jeppesen, a diesel fitter at Korns at the time of the incident with 30 years experience, described the safety culture at Korns as "not brilliant". He said that there was often poor replacement of broken components on vehicles and electrical faults. He stated that the driver's toolbox meetings were held every couple of weeks to 6 weeks when they could be fitted in and were not regular.

Communication with Contractors

Mr Shane Donnollan was the Contract Manager for Foxleigh at the time of the incident. He liaised with Korns through Mr Reggardo in relation to haulage plans and arrangements. Those arrangements included where to haul the coal from and to, the stacking plan and hauling targets. The organisational chart for Foxleights shows Mr Reggardo as reporting to Mr Herron of Foxleigh who reports to Mr Donnollan as Contract Manager. Mr Donnollan described his obligation regarding the contract as relating to production issues only with overall contractual responsibility sitting with

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the General Manager. He did not consider that he had any role in overseeing Korns in relation to safety issues.

CapCoal used Mr Donnollan as a go between with Korns, as did the Foxleigh safety department, due to the operational liaison role Mr Donnollan undertook with Korns.

Following an incident on the CapCoal (German Creek) site unrelated to this matter, Mr Richards, Safety and Health Training Manager for Foxleigh, requested Mr Donnollan follow up Korns requesting a review of the SMS and assessment of employees on the SMS. He followed up that request with Mr Reggardo and was informed that it was being done. He advised Donnollan that the employees had been assessed and the assessments signed off on and regular toolbox meetings were being held.

Mr Richards stated in evidence that in relation to safety issues, he felt that he could approach the contractors in the same way as Foxleigh's employees and require rectification of the safety situation and training to avoid recurrence in the future. He stated that there was a contractor management plan in place to manage hazards faced by contractors. The system to ensure competency of contractors included overview of the SMS to the extent that the SSE could approve the Plan.

Standard Operating Procedure #038

Foxleigh SOP #038 Fit Remove Test Maintain and Repair Tyres and Rims (2004 version) relates to the control of light vehicle tyres and wheels. Evidence from Foxleigh employees indicated that this SOP was not intended to apply to Korn vehicles which were of a different nature and used in a different application. In practice, Foxleigh vehicles in this category were usually maintained in Mackay and not on site.

The SOP for heavy mining vehicles was covered by the major mining contractor. When Foxleigh took over the mining operations in 2004, the Inspectorate conducted an audit as part of a series conducted at all surface mines. The 2005 version of the SOP was expanded significantly to reflect this change and incorporate the audit results. The 2005 version specified the requirement to deflate tyres before removing rims, including dual assemblies. It was accepted by Inspector Smith that SOP #038 was a competent document when completed. There was some evidence that Foxleigh personnel discussed this issue with Korn management. Peter Reggardo denied any knowledge of the audit prior to this incident and could not recall being involved in any discussions with Foxleigh staff about the audit or the rewritten SOP #038. He denied being provided with a form in February 2005 relating to the audit which required him to enter information and return it to Foxleigh.

Korn's procedures were detailed but failed to include the need to deflate tyres before the removal of a rim or dual wheel assemblies. They had no SOP that related to the task that Mr Davis undertook relating to that type of rim. Korn was at the time (early 2005) reviewing its Safety Management System. A draft procedure for the Maintenance of Tyres and Rims (25/5/05) was a part of the draft SMS and included a requirement that all heavy vehicle tyres be inflated or deflated to a pressure of

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approximately 30psi for demounting. The procedure was in draft, had not been developed after consultation with a cross section of the workforce and had not been communicated with the workers or supervisors. Inspector Smith gave evidence that the recommended deflation would reduce the risk of uncontrolled energy but still exceeded the provisions of the Australian Standard 4457.

Australian Standard 4457

In the opinion of Inspector Smith, this standard relates to the wheel in the present case under the definitions even though the intention of the standard when drafted was for application to wheels used on earthmoving vehicles. It was said that the application of the standard was determined by the size of the wheel and not the nature of the vehicle. The standard relates to rims of a minimum diameter of 24 inches. The rim in question here was of 25 inch diameter. It was generally established on the evidence that Big Foot trucks are not considered to be heavy earthmoving equipment but are not light/medium vehicles either. In the coal mining haulage application, the trucks certainly haul a significant volume of coal per load (270 ton estimate), on a par with some earthmoving machinery (150 ton for dump truck loaded). Similar vehicles used in the road transport industry are not subject to those loads. Distinguishing the vehicle in the present case from AS4457 would seem to be artificial in light of these facts.

The standard is currently under review. The revision is in an advanced stage and is likely to include a strengthening of the language relating to the need for tyre deflation. The size of wheel the standard will apply to is still under discussion but there is unlikely to be a change in focus from earthmoving, off-road vehicles. **If the standard does not apply to the vehicle in issue here then a deficiency in the Standard has been established in my view.**

Review of Korn Safety Management System and SOPs

A Safety consultant was engaged by Korns to go over the SMS Mackenzie River Bulk Haulage had been operating under when Korns took over the Foxleigh Contract. This review was necessary in order for Korns to commence work on the Foxleigh site. She was followed by a Safety Officer for 12 months.

Around the time Korn took over the Foxleigh hauling, Mr Richards became Foxleigh's Safety Manager. Mr Richards' role was to manage safety on site on a day-to-day basis. When a new contractor came onto site, the process was for them to go through a general induction, ascertain the type of work to be done, assess which competencies were needed, obtain evidence that the competencies had been obtained by the contracting staff, ensure there was up-to-date drug and alcohol testing conducted, have them read the relevant SOPs and sign off on them, have the OCE conduct a mine familiarisation with them and introduce them to the persons they would be reporting to. The contracting company would either adopt the mine's SMS or introduce their own through a consultative process with the mining operator.

Mr Richards had no knowledge of the haulage contract with Korns except to the extent that they were responsible for having a SMS in place and approved by the SSE.

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He asked Mr Reggardo to show him Korns SMS and found it “long in the tooth”, in some places still referring to Mackenzie River Bulk Haulage. He considered the SMS to be redundant. He requested that a review of the SMS be undertaken in about July 2004 and gave evidence that Mr Reggardo agreed to do that. In the meantime, Mr Richards had established a safety committee and conducted regular meetings that Mr Reggardo would attend. Mr Richards regarded Mr Reggardo as very safety conscious and attempting to attend to matters expeditiously.

Further, there was difficulty with the idea of a contractor merely adopting the Foxleigh SMS. Some of the tasks they undertook, Foxleigh did not and consequently there was no SOP to govern it. For instance SOP#038 in FIMS did not specifically relate to the type of equipment used by Korns. In those areas of difference, Korns were still required to conduct consultative risk assessments and develop SOPs for those tasks or plant for checking and auditing against the mine operator’s SMS.

After requesting the review of the SMS, Mr Richards made enquiries on a weekly basis as to the progress of the review. He found that it was going fairly slowly. He was told by Mr Reggardo that they were getting on with it and had outsourced the work. Mr Richards passed these updates on to the SSE at the weekly meetings. As the review was still not complete in August 2005, 13 months later, it would seem that the follow ups by Foxleigh were ineffective. They did eventually receive a draft review in late 2005.

On a parallel plane, when Mr Rix joined Korns he wanted to ensure that the SMS on all projects were reasonably complete and he met with all project managers to ensure they had a copy of the SMS on site and they had SSE approval in each case. He assumed that the SMS had been approved by Foxleigh when he arrived at the company as he felt sure that if it had not, Korns would not be operating on their site. He knew that the SMS had been reviewed after Korns purchased Mackenzie River Bulk Haulage in late 2002. In the end result, Mr Rix was not happy with the SMSs across the board as he was having difficulty mapping the SMS on another site against that mining operator’s system. He implemented a review of the plans on all sites. He stated clearly this was his initiative and was not prompted by any request from Foxleighs. As Korns operated under differing SMSs on each site, Mr Rix was looking to have a generic SMS that could be adapted to the needs of each site. In September 2004, he engaged Mr McMillan. He did that as Mr McMillan was already conducting Black Coal Competency training and to his knowledge was performing similar tasks for other companies. Mr Korn gave evidence that if he had known Mr McMillan had not undertaken this sort of work before, he would not have allowed him to be engaged.

In late 2004, Korn engaged New Horizon Safety and Training from Rockhampton to conduct a review of its SMS. This arose from a desire at Korns to update and review the SMS. Mr McMillan, the principal of the firm, had worked as a plant operator, later, in 200/01, as a safety officer in the construction industry and held a Workplace Health and Safety officer ticket.

After perusing the Plan that Korns had in place, Mr McMillan proposed that a new plan be drafted from scratch. He commenced with the basic information that Korns

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were a contracting company carting coal. He used his own template for the Plan and set up the format of the SOPs and started building them (on the understanding that the risk assessments would flow from that document). Mr McMillan did not maintain a file for the project and could not provide any background or other information on his work or instructions given to him. Mr McMillan did not appreciate any need for priority for the Plan as he assumed that Korns were operating under Foxleigh's Plan during the period of drafting.

He dealt with Mr Rix and occasionally Mr O'Dwyer. At the time of the Inquest commencing, the Plan was not complete. Mr O'Dwyer's understanding was that it was a matter for Mr Rix to assess the draft of the reviewed documents and approve them. Mr Rix approved the policy sections of the document and stated Mr O'Dwyer was responsible for an overall read of the Plan.

Mr O'Dwyer stated in evidence that he received some documents including SOPs from New Horizon from time to time. He attended a couple of meetings with New Horizons to review the drafts of the SMS and that he was liaising with Mr Rix on this issue. It came to light that he had in fact spent a couple of days in the Rockhampton office of New Horizon for the purpose of reading and reviewing the draft Plan. He said that he did not have sufficient time to read most of the document and there was still a lot of information to be included in the draft. He did not tell McMillan or Rix that he had not reviewed the document in full. He told Mr Rix that the document was moving forward and was still being worked on.

Mr McMillan drafted the Plan by having reference to Plans from other companies, the Act and relevant Australian Standards. He did not access databases for technical assistance. He did not seek a copy of Foxleigh's Plan or SOPs until after this incident. He stated that he did not access Foxleigh's information as Korn was involved with too many mines for their information to be of use to him. Mr McMillan was aware that audits had been conducted on some of Korn's SOPs but was not aware and did not enquire as to the outcome of those audits.

The draft SMS 035 which had been provided to Korns in draft in about May 2005 addressed the issue of deflation of tyres prior to rim removal and if it had been in place and known to the workers, this incident may have been avoided. Mr McMillan indicated that he thought he had obtained the provisions relating to deflation of tyres and non-destructive testing from the Australian Standard. Mr O'Dwyer was unaware of those specific provisions in the draft Plan.

Mr McMillan obtained a specimen of Mr Korn's signature with his consent and copied it onto documents so that he could organise the set up of the document. The signature at face value purported to be a signature of approval of the managing director of the company who's document it was but Mr McMillan stated that there was no intent or approval attached to the signature. The document produced prior to the incident was only ever a discussion draft. Various drafts of the document were dated but due to the computer system Mr McMillan used, there could be no confidence in the dates shown on the document. Drafts were not date tracked.

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The plan was for the draft SMS to be submitted to the mining operator at each site [redacted] was contracting for approval by the various SSEs. In practice, that took place in the form of submitting draft documents to various sites prior to the risk assessments being conducted by a cross-section of the workforce undertaking particular tasks to which the SOPs related. It seems to me that this was not what is envisaged in the legislation. Regulation 10 (Coal Mining Safety and Health Regs) lays down the requirements for the development of SOPs, in effect that a Standard Operating Procedure involves a risk assessment of a task by a cross-section of the workforce involved in that task followed by a drafting of the procedure which would then be submitted for comment and approval and once approved, the workforce would be trained on that procedure. The procedure adopted by [redacted] envisaged the risk assessment be carried out after the approval in principal stage which would seem to be non-compliant with the legislation and potentially result in an unsafe or impractical procedure being approved.

Edition 2 Revision 2 of the Plan was handed out for review and comment to all of the mining operators Korns were contracted to. Mr Korn indicated that it went to Curragh first as they were about to start working on that site and needed the Plan approved. Curragh did provide feedback on the Plan – Mr McMillan described the Plan as being savaged by them. Korns received the draft plan in about May 2005.

Mr Rix gave evidence that it had been Mr O'Dwyer's responsibility to ensure that the revised SMS translated into new systems and practices being put in place on site. Mr O'Dwyer confirmed receiving the final draft before the present incident. He agreed that he had the responsibility for overall implementation of the Plan. He stated that the draft was sent to Foxleigh Safety Officer in July 2005 to see if it was ok to be implemented or whether changes were needed. At that time, Mr O'Dwyer was not aware of all of the contents of the document. He put that failure down to time constraints – being tied up on other things and something always coming up. Further, [redacted] was completely unaware (not having read the Act or Regulations) that there was a necessity for the workforce to have been involved in the development of the SOPs and that it was inappropriate to supply Foxleigh with the Plan in those circumstances.

After the incident in question, Foxleigh demanded that the SOP relating to tyres and rims be completed. Mr McMillan then accessed a copy of the Foxleigh SOP and completed the draft SOP within 3 days. Mr Brown, the SSE, rejected a number of drafts and with comparison to the Foxleigh SOP required various changes before approval was given.

Mr McMillan stated that he was on a big learning curve and that he had not realised there would be so much in the preparation of the Plan. He had not drafted a Plan before this time. Mr McMillan stated that if he was engaged to prepare a SMS again, he would ensure that he obtained a scope of work, would diarise all discussions with the client, maintain a file, ensure the integrity of dates and drafts, and not obtain specimen signatures.

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Korn has instituted a system of a notice board for general and safety information, enabling workers to now see OCE's reports and safety information as it becomes available. Pre-start meetings are now more structured and more informative. Korn SOPs have been reviewed and rewritten and the staff trained on them. Korn Supervisors are encouraged to give written instructions to workers. Korn now manage rims by numbering them, maintaining a rim register and crack testing all rims every 12 months. Tyres are also deflated as a secondary safeguard.

Foxleigh has conducted a review of whole SMS and SOPs; reviewed contractor management system and conduct regular audits of contractors and pay particular attention to the standard of their SMS; checked all appointment letters in accordance with legislation and all appointments renewed and competencies checked; principal hazard management plan has been reviewed; tyres and rims are subject of SOPs.

FINDINGS

I cannot be satisfied on the evidence that Mr Reggardo gave an instruction to the drivers regarding the need to deflate tyres before removal of rims. It seems that no-one apart from Mr Mann, who was the only person trained in tyre fitting, was aware of the risk of not deflating despite extensive experience in many of witnesses. In hindsight, however, there were references to the hazard in SOPS relating to other vehicles, the Marshall Safety Alert (given that the risk is same despite size of machinery) and the draft Korn SMS provision. Given that the lack of identification of the hazard was so widespread, hindsight should be used with caution.

Findings required by s45(2)

I am required to find, as far as is possible, the medical cause of death, who the deceased person was and when, where and how he came by his death. I have already dealt with this last aspect of the matter, the manner and circumstances of the death. As a result of considering all of the information contained in the exhibits and the evidence given by the witnesses, I make the following findings:

Identity of the deceased – The deceased was Shane William Davis who was born on the 10th April 1976.

Place of death – Mr Davis died in transit from the Foxleigh mine near Middlesmunt in Central Queensland to medical evacuation.

Date of death – Mr Davis died on the 7th August 2005 aged 29 years.

Cause of death – Mr Davis died as a result of injuries sustained when he was struck by a tyre and rim assembly when attempting to remove them from a truck he was operating hauling coal. The incident occurred primarily due to a failure in the rim and the resultant uncontrolled release of the

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stored energy in the tyre on the adjoining rim in a dual assembly. There is no evidence of contributory factors such as alcohol, drugs or impairment of the deceased.

Comments on Issues and Preventive Recommendations

Section 46 provides in part that a coroner may comment on anything connected with a death that relates to ways to prevent deaths from happening in similar circumstances in the future.

ISSUES

Expanding Coal Industry

Due to the rapid expansion in the coal mining sector in Queensland in recent years, there are currently a large number of people without a high level of familiarity with industry working in it. Mr Brown stated that it is a significantly different industry now to that which was seen in the past.

Mine operators have placed increased reliance on contractors to provide services on site. Some contractors are large companies with mining experience but there are also those like Korns who have grown rapidly alongside the expansion in the industry and are operating on numerous mine sites under a number of different mining operators. It was submitted that the use of contractors is commercial decision for mine operators. The issues that contractors bring to a mining enterprise are a fact of life in current industry and need to be managed appropriately.

One issue that was identified by Mr Korn was that there is a need for more lead in time for contractors coming onto site to commence contracts. His evidence was that at times, mining operators required contractors to start operations almost immediately but time was needed for the contractor to properly attend to start up issues including inductions for staff, training on SOPs and SMS applicable on site, development of new SOPs for tasks not formerly undertaken and not covered in the operator's SMS and competency assessments.

Many processes of the mining operator need to be approached in a different way regarding contractors including SMSs, communication and organisational structure issues, audits and competency assessments and the operators should be aware of those issues and plan accordingly.

Mine operators need to ensure that great care is paid to the selection and control of contractors in order for the SSE to be in a position to ensure contractor compliance with the legislation.

One Safety and Health Management System on Site

A major factor in this matter was the absence of an SOP relating to a particular task undertaken by contractor workers. The SOP in the operator's SMS was related but

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applicable primarily to different machinery and was characterised by virtually all of the witnesses as not strictly applicable to the Korn task. The delay which was occasioned in the development of Korn's revised SMS allowed the situation to exist in which workers were inadvertently placing themselves at risk due to the lack of identification of the hazard of uncontrolled release of stored energy from truck tyres.

Mr Korn identified that it would be more beneficial to contractors for there to be one SMS on site that all could operate under. SOPs in relation to contractor-specific tasks could then be submitted to the SSE in the usual way for inclusion in the SMS. Mr Korn envisaged that contractors operating on a number of sites would then be working under similar SMSs without the need to go to the time and expense of attempting to develop their own SMS which would need to be varied from site to site according to the mining operator's requirements.

The lack of potential duplication of systems which would be brought about by one system on site could assist in training for workers and competency assessments across site. Further, given that the SSE is the position with legislative responsibility for the SMS on site, administration of one SMS may assist in the fulfilment of that obligation.

Recognised Standards

It has been suggested in submissions that a Recognised Standard be developed in relation to the procedures to be adopted for the "use of rubber tyred vehicles including tyre and rim safety, maintenance, inspection, record keeping and communication requirements". Recognised Standards are a means of meeting safety obligations under the *Coal Mining Safety and Health Act 1999* (Part 5, sections 71 to 73). A recognised standard is a third tier safety management process under the legislation which effectively obviates the need for the use of risk analysis techniques to manage a particular hazard or reliance on a regulation as a prescription for performance of a task. Such an approach could be seen to take the initiative (and therefore flexibility) away from the mine operator and SSE as to appropriate approach to such activities on their site when the mine operator should be in a position to meet the standards required by the Act. Further, a Recognised Standard would be of necessity fairly general in its terms in order to ensure widespread application.

Skills of Organisations conducting Safety Management System production or review

In this matter, the qualifications and experience of the principal of the company undertaking the review/redraft of Korn's are of particular concern given the importance of the undertaking. Undoubtedly Mr McMillan undertook the task in an earnest way and he was the first to admit that it was a much more involved undertaking than he expected.

Of particular concern were some of the processes adopted including the development of draft SOPs without following provisions of the legislation in that regard. Further, the length of time redraft was not acceptable and the poor communication and lack of appropriate review of the drafts as released compounded the problems. The draft SOP in the Korn SMS was overlooked by inattention to detail. However, it seems quite

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clear that there was widespread lack of appreciation of the stored energy hazard in other than earthmoving vehicles.

Of course, the SSE is the person with responsibility under the Act for the development of the SMS. A contractor engaging a third party (without input from the SSE) to perform that task tends to remove the immediate control of the process and progress of the development from the SSE.

It has been submitted that consideration should be given to amendment of the Act and Regulation for a “system of accreditation, licensing, competencies or qualifications for persons providing independent advice or other services to the industry in relation to Safety and Health Management issues”. Such a system does not fit within the current ethos of the legislation and would certainly place significant impost on the resources of the Department which does not currently play a role such as would be envisaged by this suggestion. The creation of competencies for persons fulfilling this role would achieve a similar objective within the current framework.

Contractor Management Issues

There were a number of specific issues in the present matter which contributed to operational communication difficulties. Whilst the personnel involved were confident that the communication between Foxleigh and Korn was working well, in hindsight, there was room for improvement. For instance, Mr Donnollan had no real awareness of his responsibilities of his position in relation to safety issues at the contractors. Further, neither Mr O'Dwyer nor Mr Reggardo had a copy of the Contract with Foxleigh and were not aware of the provisions of that contract, making it very difficult for them to properly attend to Korn's obligations under the contract.

Mr Anthony commented that there was a need for improved and more regular communication with contractors regarding safety matters and that integration and monitoring of contractor systems with the mine's and vice versa needed improvement with supervision by competent personnel, supported by a regular audit regime. Use of external auditors would provide another control in the audit regime to ensure effectiveness. Results of audits need to be properly documented and followed through to resolution of outstanding issues within a reasonable time frame. This was an issue in the present case.

Most mining operators already foster positive safety culture and a proactive approach to safety issues on site to prevent or reduce normalisation of risks within their own business. Such an approach should also be adopted in relation to supervision of contractor activities.

Contractors need to be made aware of all changes to SOPs in the mine operator's SMS as soon as possible after the changes. The use of electronic flags for reviewed or revised SOPs where the SMS is accessed in an electronic format would ensure that the changes are immediately identifiable. Of course, the mining operator should ensure that contractors have electronic access to the SMS if that is the system they are operating under.

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With the increasing use of contractors in the mining sector, acknowledgement of the inclusion of cultures from other industries in the mining setting is needed. The mining industry culture which is heavily safety focused needs to be identified and discussed with contractors on site to ensure all workers adopt that culture.

The evidence presented by Inspector Smith indicated that the employees of Korn, including Mr Davis, did not hold National Mining Competencies MNCG1031A: *Remove, fit and adjust wheels* or MNCG1032A: *Remove, repair and refit tyres and tubes*. Mr Davis' experience in the road transport industry was considered to be extensive but Inspector Smith commented on the need for competencies to be achieved to ensure a broad base of knowledge and information in all workers, particularly to ensure mining specific issues and points of variance with other applications.

Inductions

There is a need to ensure that inductions, whether they are generic, site specific or contractor based, fit the audience to which they are being delivered so that the information being imparted is able to be retained by the worker. A large volume of information is given to workers in a short period of time and many of the drivers in this matter indicated that they encountered difficulties with understanding and retaining the information from inductions. In many cases, one would presume that the workers being inducted may not have ever undertaken education further to school, TAFE or trade qualifications and perhaps even that not for many years. In that situation, it may be that the induction needs to be framed in a different way to those comfortable with a tertiary education method of learning.

Further, workers should be given the opportunity to retain a copy of the SOPs or other procedures/information contained in the induction. Access to a central copy within their organisation may be of limited use depending on the time a worker is able to access the information and the internal culture relating to continual revision of knowledge.

Supervisor's Competencies

It was evident from the evidence of the Shift Supervisors that whilst they were experienced people in the field, having come up through the ranks. They had obtained the required supervisory competencies, but it did not seem from the evidence that anyone had turned their mind to the supervisory capabilities of those men and whether they had the skills set needed to undertake the position. As it turns out, their knowledge in that regard could have been enhanced. Mr Clyde Davis felt that supervisors needed to have competency in risk assessment, hazard identification and controlling risks. He also indicated that the supervisors should be trained and assessed as competent against all of the SOPs and be able to train and assess workers in SOPs. He was of the opinion that there was insufficient assistance to him regarding the training and supervision of staff and that on the mine site, supervision played a much more important role than he had thought it would.

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It would seem that the skills sought would be covered in the G2 (Implement and Apply the Risk Management Process) and G3 (Establish the Mine Risk Assessment and Control System) qualifications. Whether this is necessary would be a matter for the Advisory Councils, it may be that training and practical supervision skills would suffice.

Training

The hazard of uncontrolled release of stored energy in all tyres but particularly when affixed to multi-piece rims (irrespective of size or application) now having been identified, it will all be for nought unless all persons who are exposed to that hazard are made aware of it and trained in the appropriate safety measures to reduce or eliminate the risk.

Earthmoving versus Transport Vehicles – AS4457

Clarification of the application of the Australian Standard to this type of vehicle needs to be made. If the Standard does not apply, then consideration should be given to the development of a standard for haulage vehicles in this application including a requirement to perform non-destructive testing on all multi-piece rims.

Controls

The premier controls addressing the risk from the hazard in this instance would be hard controls such as engineering the problem out. For instance, a possible hard barrier could be designed in e.g. user unable to release nuts without prior deflation. A containment mechanism to prevent projectiles (from multi-piece rim) coming into contact with people in the event of a release of stored energy might be a secondary engineering control.

Soft controls could also be introduced as secondary safeguards including improved training and supervision, promotion of good safety ethics in the business; commit to maintain standards under the Act and Regulations covering tasks being performed.

Truck Manufacture

Truck manufacturers should give consideration to reviewing designs of their products for application they are being used in to ensure components are appropriate for the usage and the machinery is fit for purpose. Section 44(6) Act requires a supplier of plant who becomes aware of a hazard relating to the plant to be responsible to inform users of the nature of hazard - some companies may not be aware of this requirement. The Inspectorate should attempt to inform manufacturers/suppliers of this provision, perhaps through the issuing of a guidance note.

Warnings

In this instance, all those using the rim were unaware of the need for any different action to that adopted in relation to the removal of wheels from trucks. If warnings were able to appear on the rim and/or affixed to vehicle instructing users to

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completely deflate tyres before removal of the rim from the vehicle, users could be alerted to the hazard. Manufacturers including more safety information on websites and encourage users to access such information would help to increase awareness of the hazard; including safety information in literature provided to users in the normal course of commerce e.g. invoices.

Rim Maintenance

Cracking of rims does occur over a period of time. Some cracking can be detected upon visual inspection (in later stages). It was discovered on examination of the rim that the critical cause of the release of pressure in the wheel assembly at the time of the incident was a crack in the rim assembly which had occurred over a reasonable period of time. The absence of tracking the age and hours of use of the rim, a regular non-destructive testing regime and the reliance on visual inspection only all contributed to the present incident.

It was quite clear that with proper co-ordination of information it was within Korn's capabilities to properly monitor rim life and maintenance at the time of the incident, given their procedures at Blackwater mine. Mr Tutin advised inspection regimes should be introduced for rims – every time one changes the tyre inspect rim and all parts of it thoroughly, adopt a non-destructive testing regime, adjust inspections as considered appropriate given the application the rim is being used in. Users should also take advice from the manufacturer.

Manufacturers of rims should consider affixing serial numbers and manufacturer markings to the rims to assist users to track rims in their business.

Access to Site for Emergency Services

David Low, of the Queensland Ambulance Service, gave evidence that most mine sites have large gate signs and warning signs situated on the roadside at the entrance to the lease. He commented that if the ambulance had been attending Foxleigh at night, the signage was such that the ambulance officers may have missed the entrance to the site. He advised that reflective signs a couple of hundred metres prior to the turnoff to the site was needed. Sgt Blain indicated that Police would not have any concerns about increased signage impacting on road safety.

Mr Brown advised that the flight time of 1 hour from either Rockhampton or Mackay for the Rescue Helicopter Services can be of critical importance in serious incidents on mine sites in Central Queensland. Whilst not directly related to this matter given the seriousness of the injuries suffered by Mr Davis, consideration should be given to location of a helicopter rescue service in the Bowen Basin.

Notification of Next of Kin

It was of great concern to me that Mr Davis' partner, his next of kin, was informed of the death of her partner by a third party and not an official from the mine. In this particular matter, Mr Clyde Davis, the uncle of the deceased, who was the shift supervisor on the day in question, made the contact. It seems that given Mr Davis

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was employed by a contractor, his details were retained at the head office of the contractor company and not at the mine. Of course it is generally the case that the Mine Manager or a very senior person in the mining company would make contact with the next of kin to inform them of the death of their loved one. Local Police also usually play a role in this regard. Co-ordination of this issue is imperative in order to avoid adding to the distress of the family of the deceased person.

RECOMMENDATIONS

Whilst progress has been made regarding some of the issues which arise from this matter, there are some areas requiring further attention. Many of the issues have industry wide application and for that reason I will proceed to make recommendations to the industry as a whole with a view to reducing the likelihood of a similar occurrence in the future.

Following the Inquest, representatives of the Mines Inspectorate, CFMEU, Foxleigh Mine representatives and other interested parties met and formulated submissions to the Coroner regarding recommendations which would operate to mitigate against similar occurrences in the future. To my mind, this is the best possible advice a Coroner could receive given that it is drawn from the significant experience and practical knowledge of the business involved, representatives of the workforce and the regulator. I sincerely thank those parties involved in the discussion and preparation of the resultant submissions. I trust that the industry will acknowledge the strength of the recommendations and the experience and expertise which lies behind them.

I have carefully considered all of the submissions. I consider that many of the submissions have merit and that most of the proposals made are supported by the evidence in this matter. Of course, I am bound by the strictures of the provisions of the Coroners Act in relation to matters connected to this death. I also acknowledge the submission from which I have drawn information included in these findings.

I recommend that:-

1. That coal mine operators critically review the effectiveness and implementation of their mine's Safety and Health Management System as **they are obligated to do** under section 4(1)(f) of the *Coal Mine Safety and Health Act 1999*. It is recommended that particular attention be paid to how the mine system controls the activities of contractors and ensures they are carrying out their tasks in a safe manner.
- 2.1 **That Senior Site Executives of coal mines be required to have a competency such as MNCG1107A 'Establish and Maintain the Mine Occupational Health and Safety Management System'.**
- 2.2 **The Safety and Health Advisory Council consider the range of competencies required for Supervisors and persons charged with the development of Safety and Health Management System.**

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- 2.3 All SSEs of coal mines develop a system to ensure that all supervisors are able to and are effectively applying risk management competencies in the performance of their duties.
3. That consideration be given to amending Section 44(6) of the *Coal Mining Safety and Health Act 1999* to require that manufacturers and suppliers inform the regulator as well as their customers in the event they become aware of a hazardous aspect of or defect in the equipment that the supplier has supplied to a coal mine.
4. That a body such as the *Resources and Infrastructure Skills Council* develop a suite of competencies for persons providing advice on Safety and Health Management Systems in the coal mining industry.
- 5.1 The Earthmoving Committee of Standards Australia review the suitability of retaining rim sizes as a limiting factor in determining the applicability of the Australian Standard 4457.
- 5.2 Standards Australia should review all associated tyre and rim standards and if necessary introduce a standard in similar terms to AS4457 which applies to all multi-piece rims irrespective of size and industry application.
- 6.1 That all coal mines employing contractors **create** a senior position for the control of contractors. Duties should include monitoring contractor's:
 - * Implementation of the mine's Safety and Health Management System including familiarisation and training of the contractor's workers; and
 - * Compliance with the mine's Safety and Health Management System.
- 6.2 This position should be included, in accordance with section 55 of the *Coal Mining Safety and Health Act 1999*, in the management structure of the mine as **a senior position** and the role and responsibilities of the position should be specified.
- 7.1 That a system be established by all coal mines to ensure the next of kin of any person involved in a serious or fatal accident can expeditiously contacted and kept informed of the developing situation. The system should address the name and contact details of the next of kin and be kept current; how the next of kin should be informed and by who; guide on how and under what circumstances the next of kin should be kept informed of developments;
- 7.2 That the protocol between the Inspectorate and Queensland Police Service be reviewed to ensure effective and timely communication flow between the organisations during the investigation.

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8. That the Inspectorate liaise with other departments, industry and professional bodies to ensure that safety message relating to the hazard of uncontrolled release of stored energy from tyres, particularly when affixed to multi-piece rims and the need for training for those exposed to the hazard is disseminated across all industries and applications of the equipment.

I now close the Inquest.

A M Hennessy
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21/3/07