

Mine Safety and Health

Investigation report

Report into a fatality at the Newlands Mine Coal Handling and Preparation Plant, Newlands, Queensland on 30 August 2016

This publication has been compiled by Mines Safety and Health, Department of Natural Resources and Mines.

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Summary

On the morning of 30 August 2016, Mr Ian Hansen was fatally injured by a falling deck plate that he and three other workers were in the process of removing. Despite immediate and persistent first aid by first responders, an Emergency Response Team and the Queensland Ambulance Service, Mr Hansen was pronounced deceased at the scene.

The incident occurred at a chain feeder at the Newlands Mine Coal Handling and Preparation Plant (CHPP) which was undergoing work as part of a general maintenance shutdown. Glencore, the operator of the Newlands Mine CHPP, had contracted UGL to undertake the maintenance work.

In accordance with its obligations, Newlands advised a Mines Inspector that Mr Hansen had been struck by a steel plate. A short time later the Inspector was contacted again and advised that Mr Hansen had been pronounced deceased. The incident site was secured by the mine. Queensland Police Service took control of the site and completed an investigation before releasing the site to the Mines Inspectorate. The investigation was completed in March 2017.

The Mines Inspectorate investigation identified several key factors that contributed to the incident including that the contract between Glencore and UGL had requirements for safe work method statements and risk assessments that were not met, the task of removing the chain feeder deck plates was non-routine, poorly planned and inadequately supervised and that the work crew and its supervisors took a less than adequate approach to risk assessments and safety procedures.

The Mines Inspectorate has made recommendations designed to address short-comings identified during its investigations. Combined with holding meetings with those in the chain of responsibility surrounding the incident, the recommendations acknowledge and address deficiencies found in the safety and health processes, to enhance the future safety of workers at mine sites

Purpose of the report

The Queensland Government believes that providing information relating to safety incidents on mine sites is important for the continual process of improving and enhancing mine site safety. The purpose of this report is to provide Queensland Government officers, business entities engaged in mining activities and the broader public with an interest in the safety of mining activities, with an understanding of how the death of Mr Ian Hansen at the Newlands Mine Coal Handling and Preparation Plant (CHPP) occurred and what might be done to minimise the risk of a similar event occurring again.

This report is based on the findings of the investigation by the Queensland Government's Mines Inspectorate (coal).

The investigation

Pursuant to Section 128 of the *Coal Mining Safety and Health Act 1999* the Mines Inspectors are compelled to investigate serious accidents and high potential incidents at coal mines.

Upon notification of the fatality the Inspector of Mines, Neil Reynoldson, instructed that the scene be preserved and mobilised Mines Inspectors to Newlands. The Mines Inspectorates' work began immediately following the incident, on 30 August 2016, and was concluded on 20 March 2017.

The investigation examined the events leading to the fatality, including the adequacy and compliance of relevant safety systems and procedures in place at the Newlands Mine site, as well as the events that occurred at the time of the fatal accident. Activities undertaken by the Mines Inspectorate included inspection and photography of the site, taking witness statements and collecting and reviewing mine site documentation.

The product of the Inspectorate's investigation and its recommendations has been provided to the Coroner.

Alerts

On 8 September 2016 Mines Safety Alert no 331 was issued (<https://www.dnrm.qld.gov.au/mining/safety-and-health/alerts-bulletins-search1/alerts-bulletins/mines-safety/fatality-involving-chain-feeder-at-a-wash-plant>). The alert provided preliminary information to the public regarding the fatality and recommended that all sites review the application and effectiveness of:

- Work planning processes and related risk assessments
- Lifting management processes
- Contract management.

The Newlands mine coal handling and preparation plant

Operated by Glencore Coal Queensland, the Newlands mine is in Queensland's Bowen Basin, 33 kilometres north-west of Glenden. The mine precinct includes an open cut mining operation that produces steaming coal and coking coal. In 2015 it produced 5,840,000 tonnes of coal.

A CHPP is the facility on the mine site used to remove undesirable material from run-of-mine coal and to size-grade coal in preparation for transportation to the market. Coal is transported from Glencore's Newlands Mine via rail to the Abbot Point Coal Terminal.

Figure 1 – Newlands mine surface layout



The fatal accident occurred at the Run-of-Mine (ROM) facility that holds the coal directly from the mine prior to its movement to the CHPP. ROM coal is fed via a chain feeder to the coal sizer then to the conveyor belts that transfer it to the CHPP. The ROM facility at the Newlands Mine consists of a bridge, two bins, two chain feeders, two coal sizers and supporting structures.

The chain feeder transfers material from the ROM bin to the coal sizer. Top and bottom decks are bolted to the main frame of the chain feeder. The chain feeder at the Newlands Mine CHPP was manufactured in 2005 and installed in 2006. Records showed that Newlands Mine completed regular operations and maintenance inspections and undertook preventative maintenance works and

corrective actions to maintain the chain feeder in an operational condition. Deck plates were replaced in 2010, 2011, 2013 and 2014 (see figure 5).

Figure 2 – Run of mine (ROM) facility layout

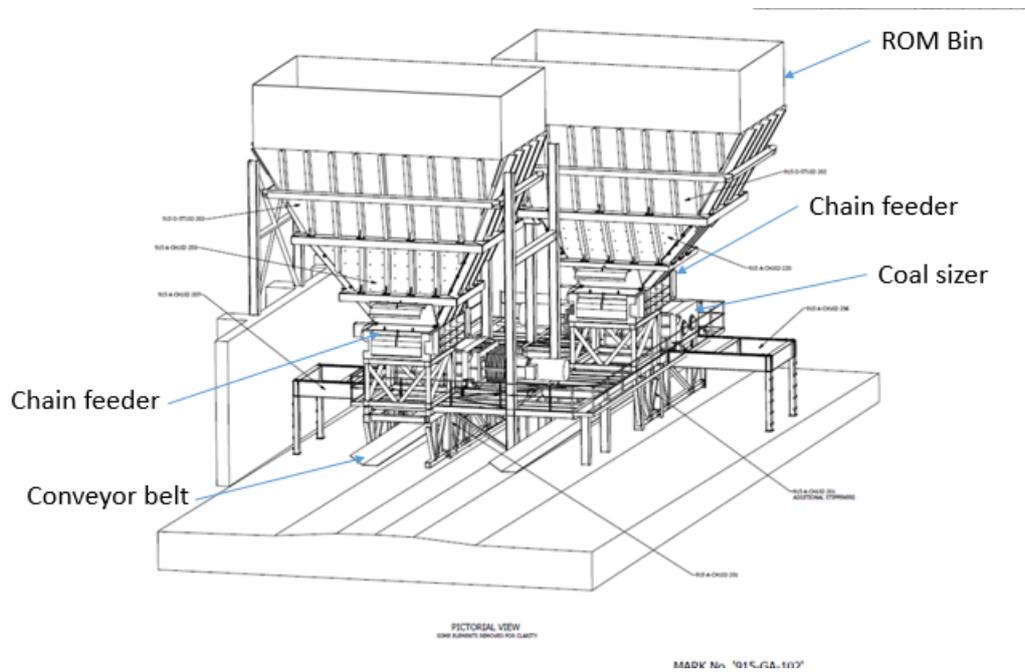


Figure 3 – Schematic of the ROM facility, showing bin, chain feeder, coal sizer, and conveyor belt (viewed from west)

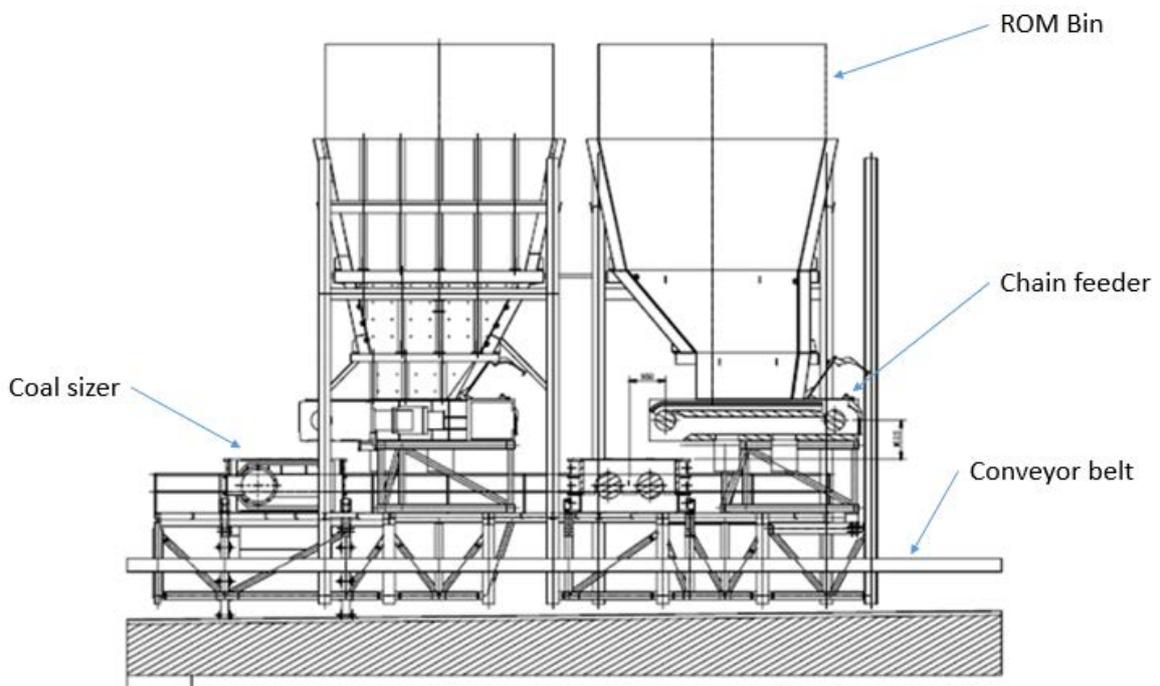


Figure 4 – Chain feeder operating principle

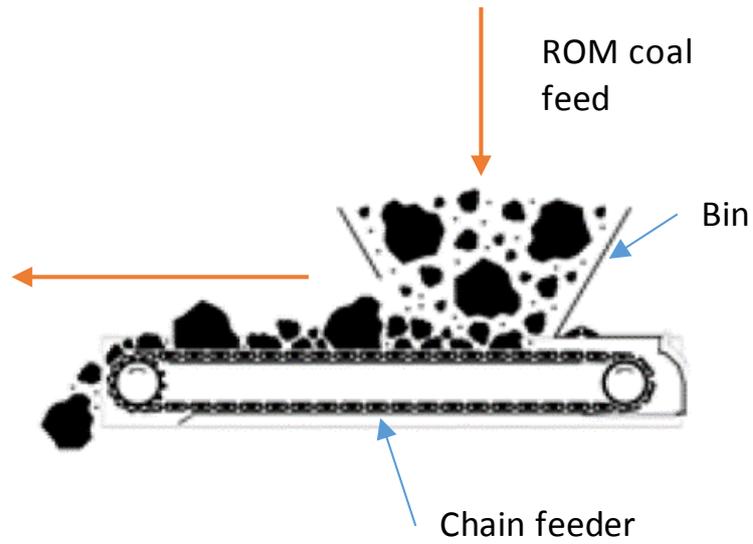
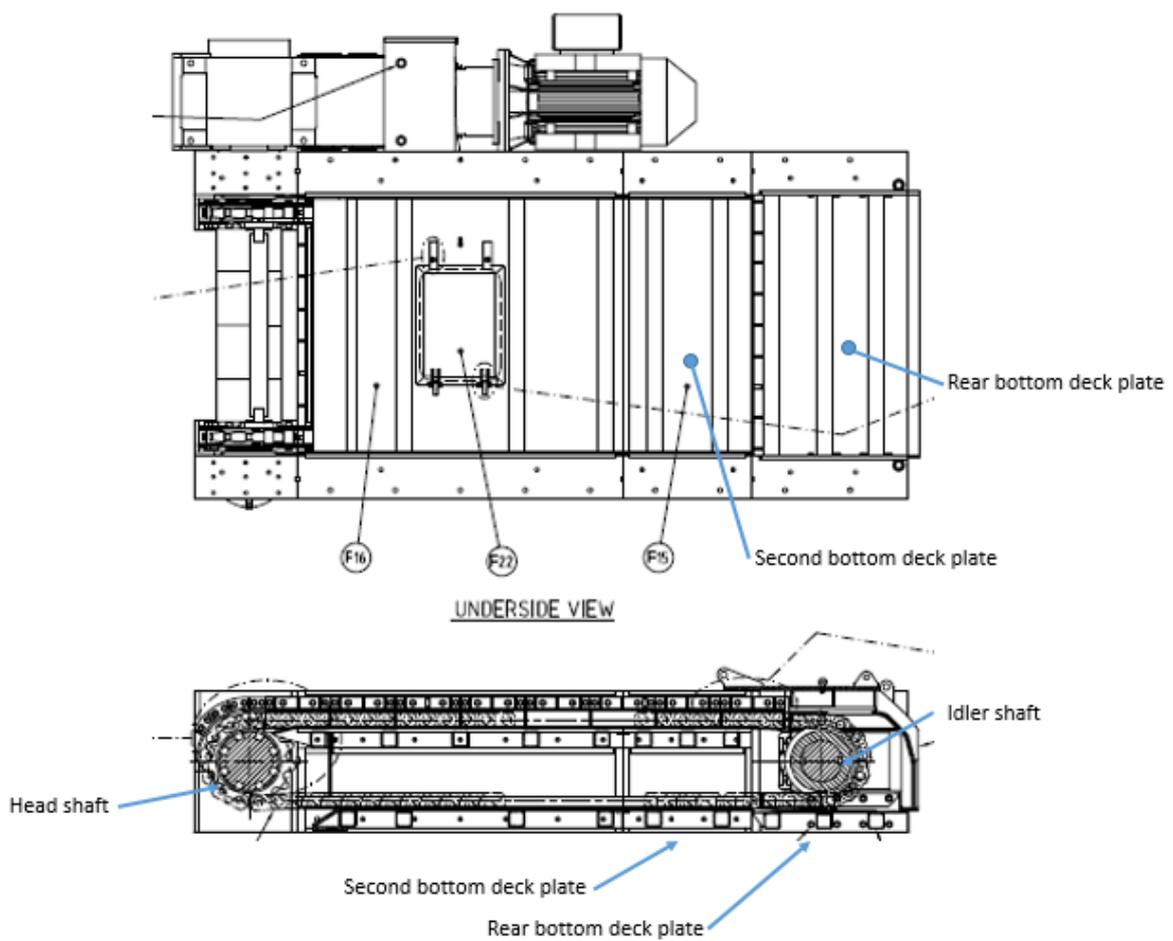


Figure 5 –Chain feeder general arrangement



The employer

Glencore is a publicly listed company that has around 155,000 employees and contractors working in the minerals and agriculture sector in over 50 countries. Glencore's coal operations in Queensland employ over 2,900 people and in 2015 produced more than 40 million tonnes of thermal and coking coal.

UGL provides contract workers for a wide range of engineering, construction and maintenance services. UGL employs and contracts over 10,000 people across Australia, New Zealand and Southeast Asia.

Glencore Coal Queensland contracted UGL Operation and Maintenance (Services) Pty Ltd (UGL) to undertake maintenance services at several sites including the Newlands Mine CHPP. The contract, Umbrella Agreement XCQ001551, was executed on 22 October 2013 and expired on 30 June 2016 (with option to extend). The investigation identified that the contract had apparently expired as the extension option had not been formally executed.

Mr Ian Hansen

Mr Ian Hansen was a 55 year old trades assistant/rigger employed by UGL. He had completed an industry medical, a Standard 11 coal surface induction and a Coal Assets Australia Glencore induction. He also held all appropriate competencies for the work he was undertaking at the Newlands site.

The incident

Requirement for maintenance work on the deck

On 14 August 2016 an in-service failure of chain feeder FE166 occurred. UGL labour was sourced by Newlands to undertake repairs that were effected in the days following. Mr Hansen was one of the UGL employees who worked on the repairs.

Inspections were conducted by Glencore personnel and it was identified that the feeder chain was stretched and a section of the bottom deck damaged. It was determined that the head shaft, chain and flights and bottom deck plates would be replaced and repairs to the tail idler shaft would be included in the scope of works for a planned maintenance shutdown. Newlands was to source replacement components from the original equipment manufacturer (FLSmith ABON). FLSmith ABON could not supply the bottom deck plates in time for the maintenance shutdown and therefore Glencore determined the plates would instead be repaired.

Newlands management undertook shutdown planning works over a period of months prior to the incident. UGL was one of the organisations engaged to undertake the supply of supervision and labour for the shutdown. A UGL site representative had been involved in the shutdown planning meetings. The scope of the maintenance works included works to be undertaken on the chain feeder FE166 and the ROM bin.

Shutdown maintenance – 29 August 2016 from 6.30am

The shutdown maintenance work began on Monday 29 August 2016 at 6.30am. Prior to commencing work a pre-start meeting for workers including UGL employees was held by Newlands. Following the Newlands pre-start meeting, UGL held a pre-start meeting. At the UGL pre-start meeting, work was allocated to various work groups as well as there being discussion of safety related topics including staying focused on the task at hand, ensuring hazards are identified and appropriate controls are put in place, watching out for your buddy and if you're unsure of anything to contact a supervisor.

A UGL mechanical supervisor was the nominated supervisor for jobs being undertaken at the chain feeder FE166 and the train load out bin. Mr Ian Hansen and three other workers were assigned to work on the chain feeder. This was the first time the four men had been assembled as a team. A level 2 risk assessment known as a Job Safety Analysis (JSA) was prepared by the crew assigned to work on the chain feeder. The UGL supervisor did not participate in the development of the JSA nor did he approve it, rather a different UGL supervisor reviewed and approved the JSA. The JSA did not include the removal of the deck plates.

Activities undertaken by the crew on that day included cleaning the area of coal and other waste, raising and securing the rear feeder door and breaking the chains. There was no formal documented communication process in place between the crew and the oncoming nightshift crew. Supervisors held an informal briefing as a form of handover.

Shutdown maintenance – 29 August 2016 from 6.30pm

A Newlands pre-start meeting followed by a UGL pre-start meeting were held at the commencement of the nightshift. These followed the same format as the dayshift meetings. In addition to the safety related information brief, verbal updates on the status of various shutdown tasks were provided by supervisors.

A nightshift crew continued with the chain feeder works, having signed onto the JSA that had been prepared by the dayshift crew. The nightshift supervisor did not review and sign the JSA. The crew did not review or prepare a new JSA to cover the new tasks associated with removal of the deck plates. One of the crew was uncomfortable with the approach and added his own assessment of the risks and controls to the JSA. No supervisor reviewed or approved the additions.

The crew had difficulty removing the damaged rear bottom deck plate. The rear bottom deck plate was supported by rigging whilst several bolts securing the deck plates to the chain feeder were removed. All the bolts on the eastern side of the second bottom deck plate were removed and it dropped approximately a quarter of an inch. The crew then employed additional level blocks and hydraulic jacks to move the rear bottom deck plate. At the end of the nightshift the rear bottom deck plate was partially removed.

During the shift the crew discussed concerns regarding the chain feeder scope of works with their UGL supervisor who then consulted the chain feeder operations and maintenance manuals held in the CHPP offices. There is no evidence that the planned work or the related JSA was altered as a result.

There was no formal communication process in place between the nightshift crew and the oncoming dayshift crew. Supervisors held an informal briefing as a form of handover.

Shutdown maintenance – 30 August 2016 from 6.30am

Pre-start meetings by Newlands then UGL followed the same format as previous pre-start meetings. The crew from the previous dayshift of Mr Hansen and his three colleagues proceeded to the chain feeder and commenced the work of removing the rear bottom deck plate (which had been partially removed by the nightshift crew). The crew discussed the work at hand and three of them signed onto the JSA. Mr Hansen did not sign the JSA (it is not known why). The JSA was not updated or modified.

At approximately 7.30am, two Glencore supervisors went to the chain feeder to look at the head sprocket. A UGL supervisor joined them but the UGL supervisor designated to the chain feeder work didn't attend as he was called away to the train load out. The three supervisors discussed the chain feeder tasks and Glencore decided not to proceed with the replacement of the head shaft. They verbally informed the work crew of the change in the work scope but they did not review the JSA. An hour later, another UGL supervisor, who had requested that the job scope be reviewed, went to check

on the chain feeder job. He believed he did not have the authority to enter the work area (as defined by plastic tape) or to alter the JSA and limited his supervision to discussing the work with the crew.

Sometime between 8.00 and 8.30am the UGL supervisor in charge of the chain feeder work received a radio call advising that the rear bottom deck plate had been removed and that a Franna Crane would be needed to remove the plate from the area. The supervisor made arrangements for the crane then visited the chain feeder work area. Upon arriving, he spoke to the crew, confirming the change in work scope. He did not review the JSA or discuss the proposed method for removing the second bottom deck plate.

The crew then commenced the removal of the second bottom deck plate. Events unfolded in the following order:

- with the remaining bolts in place, the plate was slung
- the remaining bolts were removed from the plate
- the plate did not fall (consistent with the experience of removing the rear bottom deck plate, this second bottom deck plate was jammed and therefore removal of the bolts didn't see the immediate release of the plate) then
- some time later (between 10 to 60 seconds later) the plate gave way, hitting Mr Hansen as it swung clear.

Actions of work crew during the incident

Witness statements suggest different recollections about the final events surrounding the incident. It was generally accepted that as the rigger, Mr Hansen was 'in charge' of the task.

One crew member states that Mr Hansen told him to remove the bolts from the deck plate and that he did as instructed. He was assisted by another crew member and neither of them recall having checked for people under the deck plate. The crew member who removed the bolts believed Mr Hansen was behind him.

At the time, the fourth crew member was under the deck plates and states that Mr Hansen entered the area below the deck plate to tell him that they were going to remove the bolts and that he should leave the area. That crew member left through the western side railing and saw Mr Hansen bend down, as if to leave through the eastern side railing.

The crew member that had been under the deck plates did not recall hearing the rattle gun used to remove the bolts.

Shortly after exiting through the western side railing the crew member heard the plate fall and impact Mr Hansen.

Figure 6 – Plan view of the incident site, based on witness statements

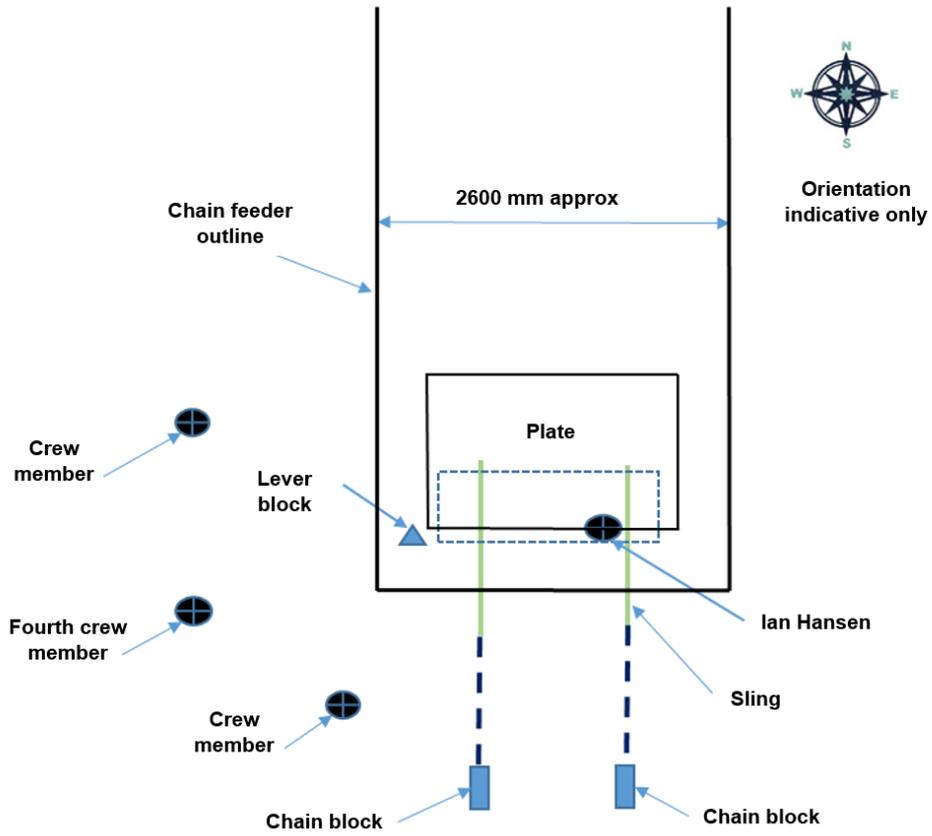


Figure 7 – Incident scene, photographed from south



Figure 8 – The recovered second bottom deck plate



Emergency response

An emergency response was immediately initiated, using a hand-held radio set at a local communication channel (Channel 22). First responders assisted in relocating Mr Hansen to the recovery position on the floor adjacent to the work area. They also realised that given its local channel setting, the initial emergency call would not have reached the main mine site station. At 10.00am an emergency call was made on Channel 1 of the radio which reached the whole mine site.

A rescue vehicle from the mine administration complex was dispatched. Ambulance and helicopter rescue services and mine ERT were mobilised. The first responders and ERT members provided first aid including CPR and attempted defibrillation. Queensland Ambulance Service (QAS) paramedic arrived at approximately 10.27am and continued to render first aid until he pronounced Mr Hansen deceased at 10.47am.

Upon a debriefing immediately after the incident the QAS paramedic commented that the ERT personnel had done all they could in the circumstances to provide first aid support to Mr Hansen.

Cause of death

Mr Hansen was struck by the deck plate as it swung free on its rigging. He was struck in the abdomen and forced back where his head struck a metal cross beam. Mr Hansen's head struck at a force and angle to lose consciousness despite wearing his hard hat.

It was reported that Mr Hansen lost consciousness and was revived several times. He was pronounced deceased by the QAS paramedic approximately 52 minutes after being hit by the deck

plate. Mr Hansen had suffered cerebral contusions and lacerations due to, or as a consequence of, hinge fractures to the base of the skull.

Environmental conditions

Inspection of the scene on the day of the incident showed that the work area was clean, with only small pieces of coal and some coal dust present. There was no apparent spillages of oil or grease.

The ROM facility had been isolated and de-energised. No conveyors, feeders or sizers were operational.

There was background noise from a truck-mounted welding generator and some periods of noise from hand tools and gouging equipment. Generally the area was not excessively noisy.

The lighting was adequate and additional lighting (torches, headlamps etc) was available.

The area under the chain feeder is demarcated by permanent handrails – this effectively demarcates areas around the feeder from falling materials. The area under the feeder had a timber plank floor erected on scaffolding to provide a work platform underneath the feeder. Access to and from the area was restricted by the handrails.

The site did not allow for a straight vertical lift of the second bottom deck plate. The plate had been rigged using the same point as the rear bottom deck plate, which had enabled a straight vertical lift. When the rear bottom deck plate dropped from its position it dropped straight down (supported by the rigging). However, utilising the same rigging point for the second bottom deck plate meant that the plate swung in an arc as it dropped. There was also no provision to support the deck plate from underneath.

Figure 9a – Phase 1 of the likely sequence of events involving the second bottom deck plate

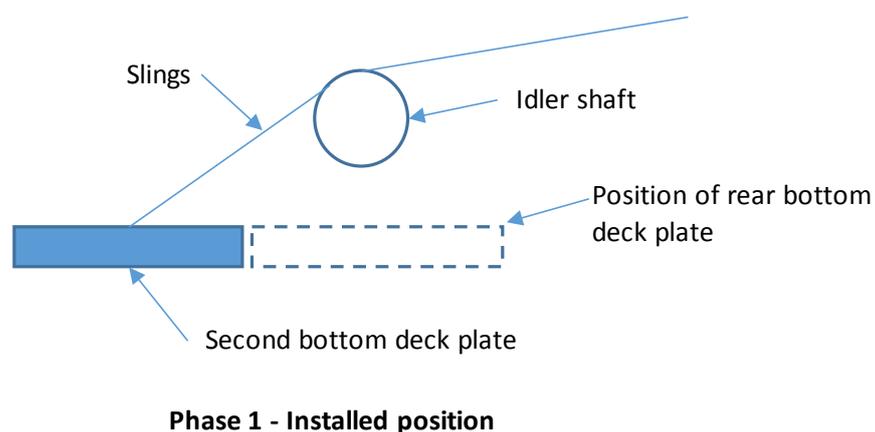
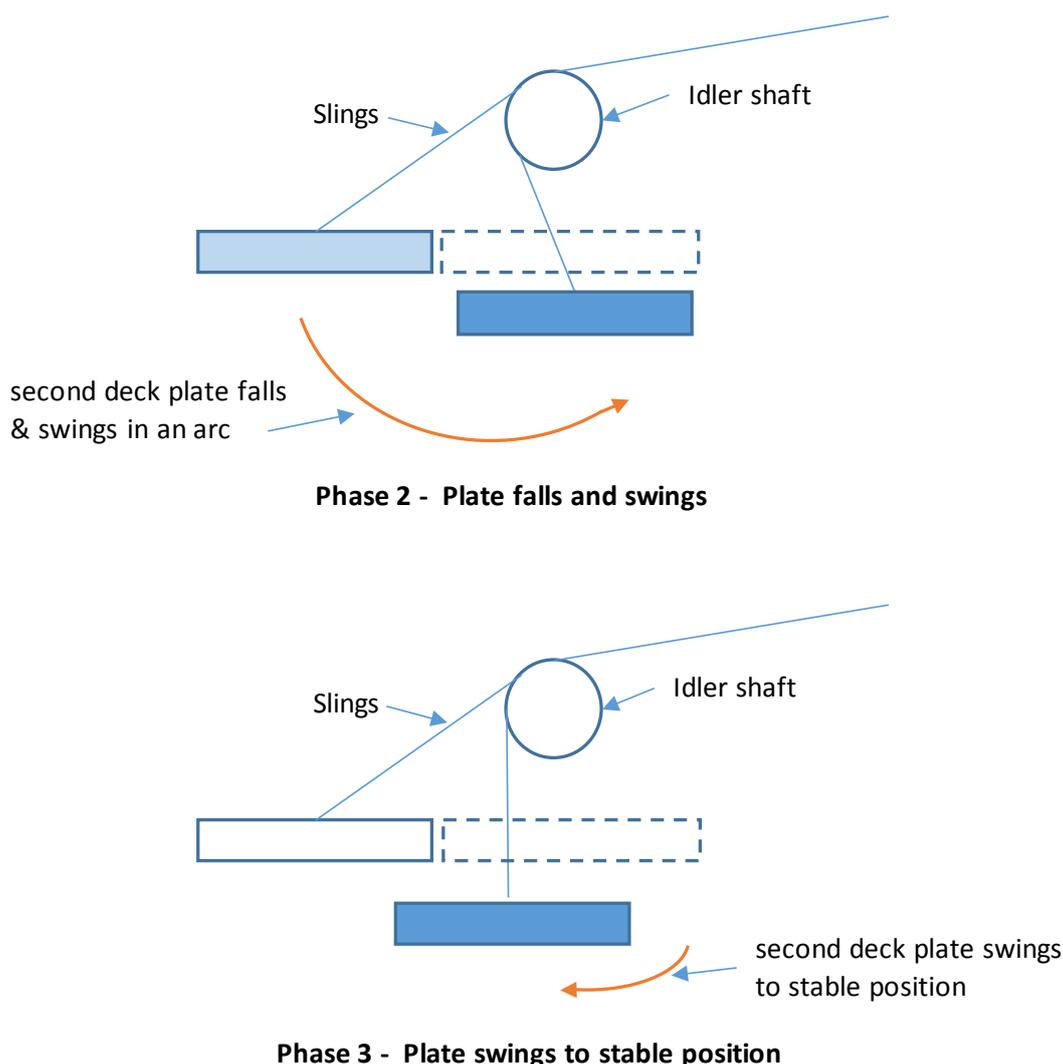


Figure 9b – Phases 2 + 3 of the likely sequence of events involving the second bottom deck plate



Safety responsibilities

Newlands has a comprehensive Safety and Health Management System which includes policies, Standard Operating Procedures and procedures that describe in detail how work is to be performed. It has also implemented SAFECOAL rules which provide for critical behaviour and actions to be maintained in the workplace.

A Newlands Surface Operations Contractor Authority to Work Permit had been completed. It specified requirements for contractors to work in accordance with the Newlands Safety and Health Management Systems.

Planning

The contract between Newlands and UGL included specific requirements related to work planning and safety and health management. The reporting of hazards, undertaking risk assessments on all tasks, the provision of Standard Operating Procedures and development of Safe Work Procedures were all required. The specific contract requirements were not known and so were not supplied by UGL nor sought by Glencore.

Newlands Surface Operations also requires a risk assessment to be completed prior to commencing work. The chain feeder work required a level 2 Job Safety Analysis. The JSA was signed-off by a supervisor that was not supervising the work which is inconsistent with the requirements of the safety and health management system. The safety and health management system requires major changes or additions to the work to be reviewed and the JSA amended and signed-off. This did not happen.

The Newlands Surface Operations standard for lifting and crange specifies minimum competencies to be held by persons undertaking lifting works. The lift was not considered to be complex and Mr Hansen held the relevant competency. A Work Authorisation Form, required for any lifting task, was not completed.

Supervision

While no formal organisational structure was prepared for the shutdown, it was generally understood by Newlands and UGL that a form of matrix structure was in place. Within UGL, the supervisor who was involved in the maintenance shutdown planning was considered to be in charge. The UGL supervisors deferred to Newlands supervisors when decisions on work scope were required.

No other supervisors involved in the incident had been involved in planning the jobs prior to the shutdown nor fully briefed on the work scopes prior to the commencement of the shutdown. There was no formal review process to ensure adequate planning of jobs.

A reliance on the experience of the work crew was evident. There was a sense that the team had the job under control and therefore didn't require strict supervision.

Communication

Pre-start meetings were held both by Newlands and UGL prior to the commencement of shifts. No documented shift handovers were utilised, rather supervisors relied on verbal reports that generally focused on areas of perceived difficulties.

UGL contractors had not necessarily worked together prior to their first shift of the shutdown. There was limited training provided in relation to team building or communications training of defining work group roles. There was no formal communication process followed to check if a work area was safe to enter or be in.

Foreseeable risk

The investigation concluded that there were a number of foreseeable risks in the planned shutdown work to the chain feeder.

An issue of risk was the unknown properties of the deck plates. The Original Equipment Manufacturer (OEM) manual did not contain a risk-based methodology for removal and replacement of the deck plates and there was no request made to gain such information. The investigation following the incident found a discrepancy in the mass of the deck plate. The OEM stated the mass to be 890kg but it was actually 390kg. Without a known risk-based methodology and correct information, the planning for the removal of the plates could not have been comprehensive.

Gaps in the supervision of the chain feeder work are apparent. The delineation of responsibility between Newlands supervisors and UGL supervisors, the hand-over between dayshift and nightshift supervisors and the supervision of the JSA covering the work (its development and amendment) were unclear and did not adhere strictly to policies and procedures.

The personal interactions in a work team creates a foreseeable risk. Without a known and utilised protocol for communication at stress points or action points in a task, the risk for miscommunication is present. This is ever more so when a work group is newly formed, as was the case in this incident.

Actions

A departmental Compliance Review Committee Meeting was held on 13 April 2017 to consider and make recommendations about appropriate actions in response to potential breaches of mining safety and health legislation in relation to the incident at the Newlands Mine CHPP.

The committee, consisting of three senior DNRM officers, considered the Inspectorate's investigation material both through a written report and verbal presentations. The meeting was run in accordance with the Mines Inspectorate Compliance Policy which assists officers to exercise their legislative powers consistently and transparently, and ensures that recommendations are assessed in a fair and equitable way.

The committee recommended that:

- Glencore Coal Queensland be subject to an accountability meeting at the Department of Natural Resources and Mines head office with Chief Inspectors, Regional Inspectors and the Commissioner of Mine Safety and Health
- Glencore Coal Queensland be asked to undertake a public presentation on this accident;
- a number of personnel surrounding the incident (12 in total) attend a site management accountability meeting at the Regional Inspectors Office
- the Department of Natural Resources and Mines proceed with a public release of information relating to this incident
- in light of the department's prosecution policy, there was no public interest in prosecution.

Conclusions and recommendations

The investigation concluded that Mr Hansen was in a known danger area when the deck plate swung in an arc into him.

There were a range of failures surrounding the incident including that safe work method statements and risks assessments required under the Umbrella Contract were not made, a known method for removing the deck plates was not obtained, the risk assessment for the task was not comprehensive and supervision was lax.

As the work on the chain feeder progressed there was little formal communication between the shifts or among supervisors, procedures to update the JSA reflecting changes to the task were not followed and the supervisor was not always close at hand.

The factors that contributed to the incident can be grouped into planning, supervision and communication.

There was a lack of detailed planning to guide the chain feeder work. The process for removing the plates appears to have relied on the workers' knowledge of similar structures and estimating possible outcomes. This led to unnecessary risks in undertaking the work. The lack of planning to clearly outline the equipment to be used and the standards to be followed also led to the use of substandard engineering practices.

More rigorous supervision of the process - from ensuring the Umbrella Contract was properly made to signing off on amendments to the process of removing the plates – would have provided greater opportunities to identify and mitigate risks on site.

There was an evident lack of formal communication channels and practices. Between supervisors, between work groups and within work groups, poor communication is evident. At the time of the incident there was a misunderstood communication, as the bolts were removed prior to clearing the area under the deck plates.

Some of the oversights surrounding the incident occurred due to a less than rigorous enforcement of existing safety and risk assessment procedures while some appear to have arisen due to gaps in the safety and risk assessment regimen. Accordingly, the Mines Inspectorate (coal) has made a number of recommendations.

- Newlands Mine SSE:
 - audit the application of risk management procedures as they are practised on a day to day basis. Based on results of the audit initiate necessary changes to ensure risk assessments meet the requirements and standards in the site SOPs.
 - Implement internal audit processes to review and check on an ongoing basis the quality of the risk management assessments being undertaken at the site and to implement the necessary corrective actions to ensure site established standards are maintained.
 - review supervision arrangements, in particular supervision arrangements for shutdown work. The review should consider roles, responsibilities, qualifications, span of control, shift to shift communication expectations and specific tasks and behaviours supervisors must demonstrate each shift when supervising coal mine workers.
 - review and establish minimum requirements for the level of planning of works to be completed prior to actual work being undertaken. The review should consider the degree of work planning required prior to shutdowns, work method statement development, risk assessment, quality checks and approval to proceed processes.
 - review the site SHMS and corporate contracts and resolve inconsistencies between corporate and site requirements.
 - implement training/familiarisation processes to ensure relevant supervisors are familiar with the terms and conditions of contracts.
 - review the site "Introduction of equipment to site" processes to ensure all equipment used by contractors is fit for purpose.
 - be requested to present at industry forums learnings from the incident.
- UGL:
 - review the set-up and management of work groups. The review and actions should consider who is in charge of the work group, work group expectations, rapid assembly of teams, teamwork and communication processes within work groups. UGL should provide training in teamwork and communications between work group members with an aim of minimising teamwork failures.
 - implement processes to ensure equipment is used in accordance with recognised standards and manufacturers recommendations. This should include documented records of inspections of equipment prior to use.
- FLSmith ABON should provide updated operations and maintenance manuals to the mine for the chain feeder that include a risk-based methodology for foreseeable tasks as far as reasonably practicable.
- The DNRM communicate to industry circumstances and learnings from the incident.