

MINE SAFETY NEWS

Department of Mineral Resources

www.minerals.nsw.gov.au

February 2000

NEWS

THE AFTERMATH OF THE NORTH PARKES TRAGEDY

In the aftermath of the Northparkes tragedy, it is vital that we are able to learn from its experiences and reflect on the events that followed.



Photograph - compliments of Northparkes

The Northparkes Emergency Rescue Team

THE DAY OF THE TRAGEDY

Wednesday 24 November 1999 was maintenance day at the block caving gold and copper mine at Northparkes, in the Central West of New South Wales. 61 men and women were carrying out tasks throughout the modern computer controlled underground workings.

On number one level of the exploration tunnel, two drillers, Stuart Osman and Colin Lloyd-Jones were working under company instructions to drill into the ore body in an attempt to bring down a section of rock. They had been visited earlier to talk about the job

and its progress by the mine manager, Ross Bodkin and his technical services team leader Michael House.

At around 3 p.m. the orebody gave way, dropping into the cave and pushing a massive rush of air down the exploration tunnel and through the decline and ventilation shafts. The wind, estimated at more than twice the force of a hurricane, caused major damage and killed Stuart, Colin, Ross and Michael.

New study into Remote Controlled Equipment

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For four hours the 57 workers in the mine were led past the debris and through the unserviced underground tunnels to safety. Remarkably, the only other injury between them all was a cut finger.

EMERGENCY RESCUE TEAM - RECOVERY ACTION

Wednesday 24 November

The complex recovery procedures following the tragedy went very smoothly and credit must be given to all involved, especially the Acting Mine Manager, David Vink and members of the Mine Rescue Teams.

A rescue team was formed and mobilised underground immediately. At the same time two additional teams were formed on the surface. The team from underground moved small groups of people from the main extraction level to a point in the decline where the rescue teams had formed a line, using rope as a guide, through debris that prevented further vehicular movement. These people were guided through the debris-strewn part of the decline and transported to the surface. As personnel were brought to the surface tag board, they were met by ambulance officers who gave each individual a thorough medical check. In total 57 people were evacuated from the mine.

Power, communications and ventilation were non-existent in the decline. One ventilation fan was rendered inoperable and the vent housing was damaged. The hoisting shaft had been closed over for maintenance activities, with the doors sand-bagged. Even so, the doors had been blown open while the two conveyances had been stopped mid-shaft. Accordingly, use of the shaft before a thorough inspection had taken place was risky. Evidence, especially in the decline, had to be preserved.

The chance of a second collapse needed to be ruled out completely before re-entry. The volume of the open pit before and after the collapse was compared with the known volumes of pre-collapse broken ore, solid ore and void.

A wide range of checks and some repairs of equipment including isolation of power and water, as well as preparation for the recovery, took two days, until it was determined that the chance of a second collapse was effectively zero. The first task was to re-instate ventilation; a truck was parked in the top breakthrough from the decline to the vent

shaft, and the vent fan was test-run. The recovery then started first thing the next morning, the third day after the air blast.

THE BODY RECOVERY OPERATION

Saturday 27 November

The body recovery operation, conducted three days after the incident, went as planned. Rescue Teams entered the mine at approximately 7.30 on Saturday morning and successfully completed the recovery by late afternoon. Family members, management, contractors and Northparkes employees, who wished to be present, were at the portal when the bodies of Stuart, Colin, Ross and Michael were brought to the surface.

Three main teams and three smaller teams were formed, as a result of careful planning during the previous two days. The lead team consisted of Rescue members, Chris Ramsden and Shane Innes, with one Department of Mineral Resources representative, Rob Regan, and four external investigators. The underground (upper section) transport team was Debbie Bingham, James Davison and Kellie Piercy. Team One was responsible for the initial body transportation underground (lower section) and was made up of Scott Symons, Daryl O'Neil, Kevin Frances, Jamie Pope, Russ Constable, and Charlie Love. Team Two set up a fresh air base just above the debris area and cleared as much of the decline as possible to allow better vehicular access. Team Two members were Rob Phillips, Con Murphy, Helena Swan, Louis Van Der Merwe, Drew Allsop, Mark Turnbull and Sean Pusterla. David Vink, Gabby Love and Nick Mercer controlled the surface area and communications with underground.

Cadia Mine supplied a back-up Rescue Team while Police Rescue, the Ambulance Service and the Coroner's Office played very active roles, successfully coordinating their tasks with Northparkes personnel. All Rescue Team Members and support personnel involved, performed their tasks in a very professional manner, under difficult circumstances and are a credit to Northparkes.

THE ROLE OF THE INVESTIGATION UNIT

Directly after the Northparkes tragedy the Department of Mineral Resources was notified. The independent Investigation Unit set up by the Department gathered together



their resources, and arrived on site at Parkes shortly afterward. The Investigation Unit is currently working to unravel the sequence of events leading up to the fatal air blast.

The Investigation Unit officers present at Northparkes immediately after the accident were Peter Doyle, Murray Johnstone and Garth Sheehy. The Investigation Unit formed a working relationship with the Police on the site to ensure that the appropriate steps were taken to ensure that the Coroner could deliver findings in relation to the four fatalities.

The priority was to recover the bodies of the four deceased as soon as possible. Working closely with Mark Stephens - Regional Inspector of Mines, Rob Regan - Assistant Director Safety Operations, and Graham Terrey - Director Mine Safety and Environment (Chief Inspector of Mines); the Northparkes Mines management team developed a strategy to determine that it was safe to re-enter the mine and develop a plan for the recovery of the bodies. The Investigation Unit and the Police worked with these teams to ensure that the necessary forensic examinations of the scene could be carried out as the bodies were recovered. Garth Sheehy joined the Mines Rescue teams and the Police on the tasks underground to gather important physical evidence.

In the week following the tragedy, the Investigation Unit together with Northparkes personnel and the Regional Inspector undertook inspections of the underground workings. The Investigation Unit used these inspections to locate all physical evidence from the air blast throughout the mine.

Working with the Police, the Investigation Unit also commenced to take witness statements from the fifty-seven persons who were underground at the time of the air blast and many others who witnessed events on the surface or who were part of the rescue efforts.

A detailed study of documents relating to the management of the caving operation, and interviews of key personnel at Northparkes Mines, will continue over many weeks. The Investigation Unit has engaged a geotechnical consultant to assist with the investigation and to provide expert advice on the geotechnical reasons for the collapse of the solid ore into the void.

The Investigation Unit will prepare a complete report on the accident that will be provided to the Coroner through the Police. After the Coronal process, the findings of the investigation will be made widely available to the industry and the public. Key issues or

lessons which can be learned from this event will be deliberately spread across the industry.

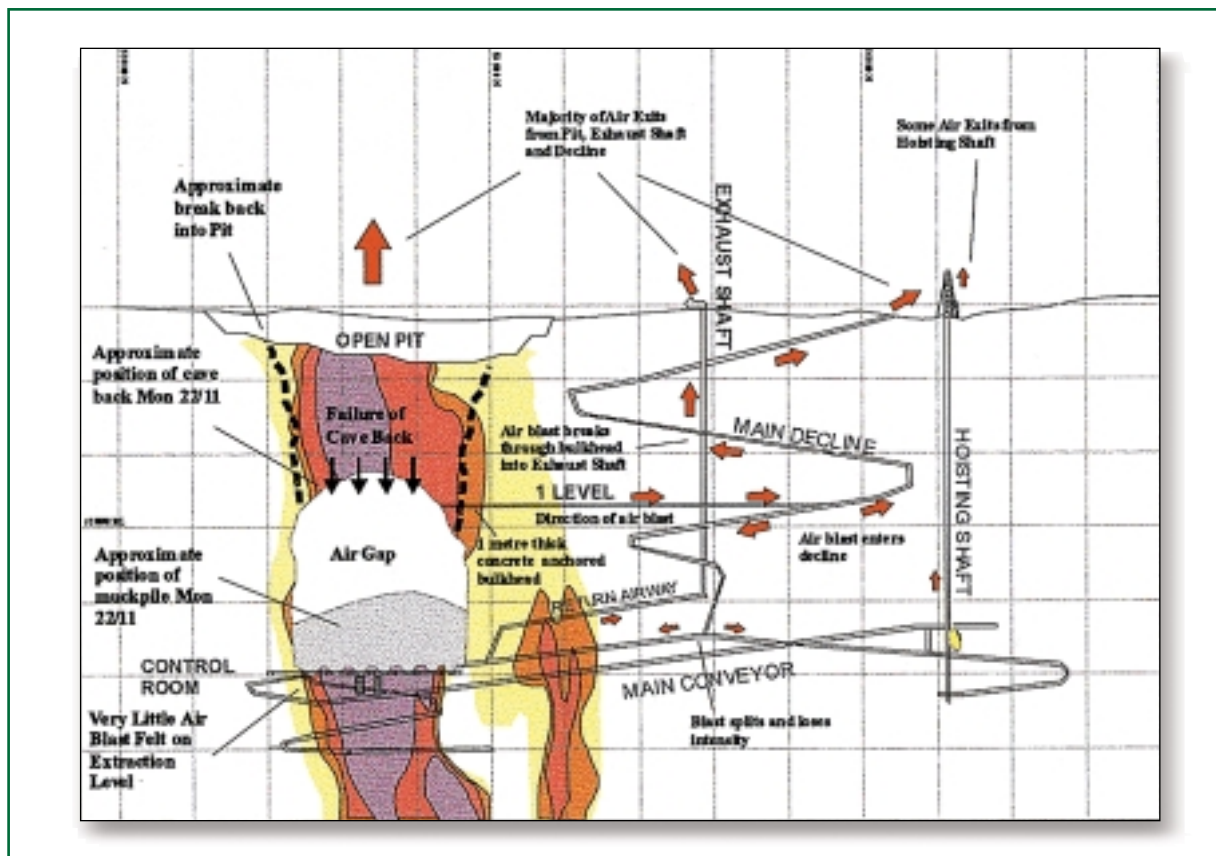
THE NORTH LIMITED INVESTIGATION TEAM

North Limited has established an investigation team independent from, but co-operating with, the investigation by the Department of Mineral Resources and the Coronal process.

The North Limited team will investigate the events leading up to and including the four fatalities at the Northparkes mine on November 24 1999.

The North team will conduct a comprehensive investigation into the causes of the accident to identify recommendations for improvements at Northparkes specifically and to block caving in general.

The team will be facilitated by Professor Jim Joy, the Director of the Minerals Industry Safety and Health Centre at the University of Queensland, and will include experts both from inside and outside the Company covering geotechnical and mining matters, organisational issues, safety and risk management and Human Resources. ■



The cause of the sudden air blast at Northparkes

SAFETY ALERT



TRUCK DRIVER RAISES TRAY UNDER POWERLINES

INCIDENT

A truck driver narrowly escaped death when he raised the tray of his on-road haulage truck into 11,000 volt overhead power lines.

CIRCUMSTANCES

The driver was employed by a contractor to haul concentrate from a mine site. His truck was parked at the unloading bay, situated under power lines that are eight (8) metres off the ground. The driver was outside the vehicle, watching the movement of the tray while leaning into the cabin through the open driver-side, operating the tray lever control and the accelerator pedal by hand. The driver was raising the tray when suddenly he saw sparks flying from the front of the tray and out of the tyres directly beneath. He realised the tray had made contact with the overhead power lines. He immediately operated the control lever to lower the tray away from the power lines. The power was tripped out by the protection mounted on the power pole.

INVESTIGATION

- The truck unloading bay was situated under the lowest section of the power lines, which were eight metres off the ground. When the tray made contact with the power lines, the current travelled to earth through the truck.
- The protection which tripped out the high voltage power supply is in fact designed for automatic resetting and reclosing. The power system did have earth leakage protection, but is not designed to safeguard against personal electrocution. The driver was lucky to escape electrocution.
- After the incident, it was found that two of the three power lines were half melted through. There were burn marks on the tray and tarpaulin, and burn marks on the driver's-side front inner and rear outer tyres.
- Past experience has shown that brief contact with power lines can cause one or more truck tyres to explode immediately, or hours after the event. The heat generated in the tyre creates an explosive gas which may ignite. The truck should have been isolated immediately and left for 24 hours.

RECOMMENDATIONS

A risk assessment should be conducted at all sites to identify all potential hazards associated with overhead power lines at each location. The assessment should examine:

- Exclusion of any loading, unloading or maintenance operations under power lines,
- Safe clearance distances in accordance with Australian Standards,
- Traffic rules and travel routes,
- Training of operators and drivers, and management of contractors,
- Adequate signage on sites and reminder signage in vehicle cabins,
- Isolation of equipment for 24 hours immediately after such an event.

R Regan

ASSISTANT DIRECTOR, SAFETY OPERATIONS



Photograph - compliments of Keith Chitman

Truck driver raises tray under 11,000 volt overhead powerlines



What is a Safety Alert?

A Safety Alert is sent to mine managers and other industry personnel, to alert manager and miners of potential hazards, after certain serious or fatal accidents in NSW mines. Before the Safety Alert is sent, a thorough investigation finds the cause of the event, and decides what further action to take. A Safety Alert is a quick response warning mechanism, as an investigation and potential hearing can take up to two years to finalise.

At the November 1999 meeting of the Mine Safety Council it was agreed that Local Check Inspectors of the CFMEU should receive information on safety issued by the Department. At present this information is forwarded by mail to senior officials of the various mining unions and associations.

This initiative will allow for faster and broader dissemination of Safety Alerts and

mining, mechanical and electrical guidelines, produced by the Department of Mineral Resources, Mine Safety and Environment Division.

Any other industry groups who need to be included on the data base to be sent Safety Alerts and safety information, please contact Steve Stewart on (02) 9901 8413 or e-mail stewarts@minerals.nsw.gov.au

'Safety Alerts' - or ..."if only I'd known that could happen..."

People in the mining industry like to know, that if something harmful could happen to them, they could be informed how to prevent such an incident through proper management of hazards.

The Department of Mineral Resources is in a position to hear about risks and to pass on warnings. The Government believes that Safety Alerts are a method which the industry welcomes and finds useful.

The experiences of others are often a valuable learning opportunity, and Safety Alerts provide a rapid exchange of practical, real life experiences, for this purpose.

The Government does not have to wait to put legislation in place or develop a guideline to be able to prompt a new thought on safety. Safety Alert information can eventually find its way into guidelines or legislation, but people are often interested in knowing more quickly if they might be exposed to a hazard. These hazards may be previously unknown to them. In addition, a Miner may think that such an occurrence is unlikely. The Safety Alert points out the hazard and allows mines to take immediate action.

If someone has been unfortunate enough to have been involved in a risky encounter, they would like others to know in time for them not to be caught in the same predicament.

However, distributing too many Alerts may be counterproductive. Too few, or the wrong Alerts can be distracting. The Department needs to make this decision and have an up-to-date mailing lists of mine managers and miners' representatives to distribute relevant Alerts quickly.

The Department also acknowledges that people will look at Safety Alerts, use them and eventually lose them. Our new Internet site will allow people to go back to past experiences, to look at trends or recurring themes. This will be valuable for building guidelines. Our Internet site can be seen at www.minerals.nsw.gov.au

The Department is also moving towards using international (as well as interstate) experiences. Our link with the Mine Safety And Health Administration in the USA is the commencement to formalising these links.

Let's aim not to hear someone say "if only I'd known".

Graham Terrey,
Director of Mine Safety and Environment.



Graham Terrey, Director of
Mine Safety and Environment

CONVEYOR BELT RISK: A REAL CASE STUDY EXAMPLE

On 20 January 1999 Brant North had both his legs amputated at Oaky Creek No 1 Mine in Queensland. He was caught by the longwall mining system's armoured face conveyor (AFC), a chain and flight bar conveyor.

While the accident occurred in an underground coal mine the findings and recommendations are relevant to all sectors of the NSW mining industry.

Nature of the Accident

On the night shift of Wednesday 20 January 1999 at approximately 0500 hours, trainee Miner, Mr North caught both legs in the AFC chain at the tailgate drive sprocket of longwall at Oaky Creek No 1 Mine.

Mr North and Adam Clarke, a contract miner, were engaged in the task of unloading a mesh basket of winches, placing some winches on the AFC drive and the rest on the ground by the tailgate drive. After placing some winches on the AFC tailgate drive, Mr North climbed up onto the tailgate drive to clear room for more winches.

In descending the AFC tailgate drive, Mr North's legs were caught in the AFC chain and a flight bar, dragging him for approximately seven meters. Mr North was trapped for approximately four hours. The extent of the injuries required a surgeon to amputate both legs to free him before being transported to the surface of Oaky Creek No 1 Mine and to Rockhampton Hospital.

Cause of Accident

From the evidence presented at the Inquiry, it was concluded that –

- 1/. The normal access way to and from the tailgate end of the longwall chocks and the tailgate roadway was blocked by the positioning of the goaf flushing chains located on the tailgate side of chock number 133. As a result, persons accessing the face via the tailgate roadway were forced to use an alternative route.
- 2/. Mr North was exposed to unacceptable risk by remaining on top of the tailgate drive during the pre-start warning sequence and subsequent start-up of the AFC.

Major Contributing Factors

The decision to install the goaf flushing chains on the tailgate side of chock number 133 was made without the benefit of a formal, comprehensive risk assessment and consequently the additional hazards created by this action were not recognised and not appropriately addressed.

The tailgate drive was not isolated and it was not possible to isolate the AFC without first crossing the tailgate drive of the AFC.

Mr North and Mr Clarke, given their limited exposure to the workplace and the work to be performed, were not adequately trained and supervised.

The extent of injuries and duration of recovery operations were compounded by the excessive wear of the AFC flight bars and the modified cover which exposed a portion of the AFC sprocket and the lead section of the flight bar re-router channel.

There was no positive communication between the work team on the main gate end of the face line, which started the AFC and Mr North and Mr Clarke on the tailgate end of the face.

The inquiry was satisfied that no effective measure or hard barrier was in place to prevent the accident. Verbally defining a work area and expecting a worker to stay within the defined area is not an effective control.

Recommendations

- When there is a perceived need to modify equipment, alter the workplace or amend standard operating procedures, and such a change may impact on the health and safety of persons, a comprehensive formal risk assessment must take place.
- When such a risk assessment has been undertaken, the risk treatment options must be in accordance with the hierarchy of control.
- The development and implementation of an industry standard for the effective management of contract labour with particular emphasis on experience, qualifications and training.
- That positive isolation for the tailgate drive be installed at a convenient and accessible location, as close as possible to the nominated access path, to and from the tailgate roadway. ■■



1 MARCH 2000 DEADLINE FOR GUIDELINES

Coal Mine Managers have been asked to provide their feedback on the draft guidelines for legislation by 1 March 2000. The draft Guidelines were for General, Underground and Open Cut Legislation.

Draft versions of Guidelines in support of the 1999 Regulations to the Coal Mines Regulation Act 1982, were released to industry stakeholders for comment.

This action was undertaken to provide the industry with material, to help develop systems required by legislation. The material also provides general guidance on specific issues to support legislation, such as cutting and welding underground and installation of auxiliary fans.

Draft or finalised system Guidance material does not apply to any mine unless specifically decreed by the Chief Inspector of Coal Mines, either by gazettal notice or notice by letter to individual mines. Guidelines for First Aid and Outburst have been already finalised and

published. All other Guidelines distributed have received relatively little feedback from Mine Managers.

Guidelines must be relevant to the industry. This will assist in the quality of the Legislation for all industry members.

When feedback on Guidelines is returned to the Department of Mineral Resources, a mixed industry working group will analyse feedback and incorporate comments. It is envisaged that Guidelines will then be published by 1 September 2000, on the anniversary of the Legislation. ■■

THE CHIEF INSPECTOR OF COAL MINES: ON GUIDELINES



Rob Regan, Chief Inspector of Coal Mines.

Dear Industry,

I encourage industry personnel to send their comments on all aspects of the draft Guidelines to the Department of Mineral Resources, Safety Operations, so that improvement can be made before publication. Feedback to date has been limited and generalised.

At the December 1999 Coal Safety Advisory Committee meeting, I outlined the likely next step to review the draft Guidelines. Following feedback from industry, Guidelines will be reformatted taking into account the following features:

- relationship to the Act, Regulations, Standards and Codes of Practice*
- purpose of the Guideline*
- types of Guidelines - technical processes, health and safety processes, health and safety systems and people related processes*
- target audience - management, technical specialists, operators and maintenance personnel*
- style and content of Guidelines - activity description, known hazards, known controls and methods of monitoring.*

I envisage a development process following production of an agreed Guideline format, that will enable Guidelines to keep at the leading edge of safety developments with rapid communication to all stakeholders.

In developing your Safety Management Plan and Systems for the new Coal Regulations, note should be taken of the draft Guidelines as one source of information. The final content of your documents will be your decision, based on workforce consultation and research to satisfy your duty of care. Draft Guidelines are not finalised Guidelines and are not a mandatory prescription for industry use.

Yours sincerely,

*Rob Regan
Chief Inspector of Coal Mines.*

INFORMATION FOR FAMILIES

The Department of Mineral Resources Investigation Unit, together with the Coroner's Support Unit and WorkCover NSW, have assembled an information package to inform families of the procedure following death of relatives in a mining accident. The information has been prepared to assist

families to understand the official processes following a fatal accident in a metalliferous mine, coal mine or quarry.

The package supports families through the grieving process, by listing numerous clinics and counselling services which can be easily accessed by families. Also listed are contacts who can provide cooperation and legal assistance. The package then explains the

roles and responsibilities of the Department of Mineral Resources, the Police and the Coroner, and describes what they will do after the accident.

Families interested in further information regarding this booklet should contact Stede Coundouris or Peter Doyle at the Investigation unit in Sydney on telephone: (02) 9649 8959.

STUDY TO EXAMINE RISKY BEHAVIOUR WITH REMOTE CONTROLLED EQUIPMENT

A pilot study has been commissioned by the Department of Mineral Resources to investigate risky positioning behaviour by operators and maintainers of remote controlled coal mining equipment.

The purpose of the study is twofold. Firstly to measure how often people enter "no-go zones" around remote controlled coal mining equipment. Secondly, the study will assess and analyse why people enter the "no-go zones".

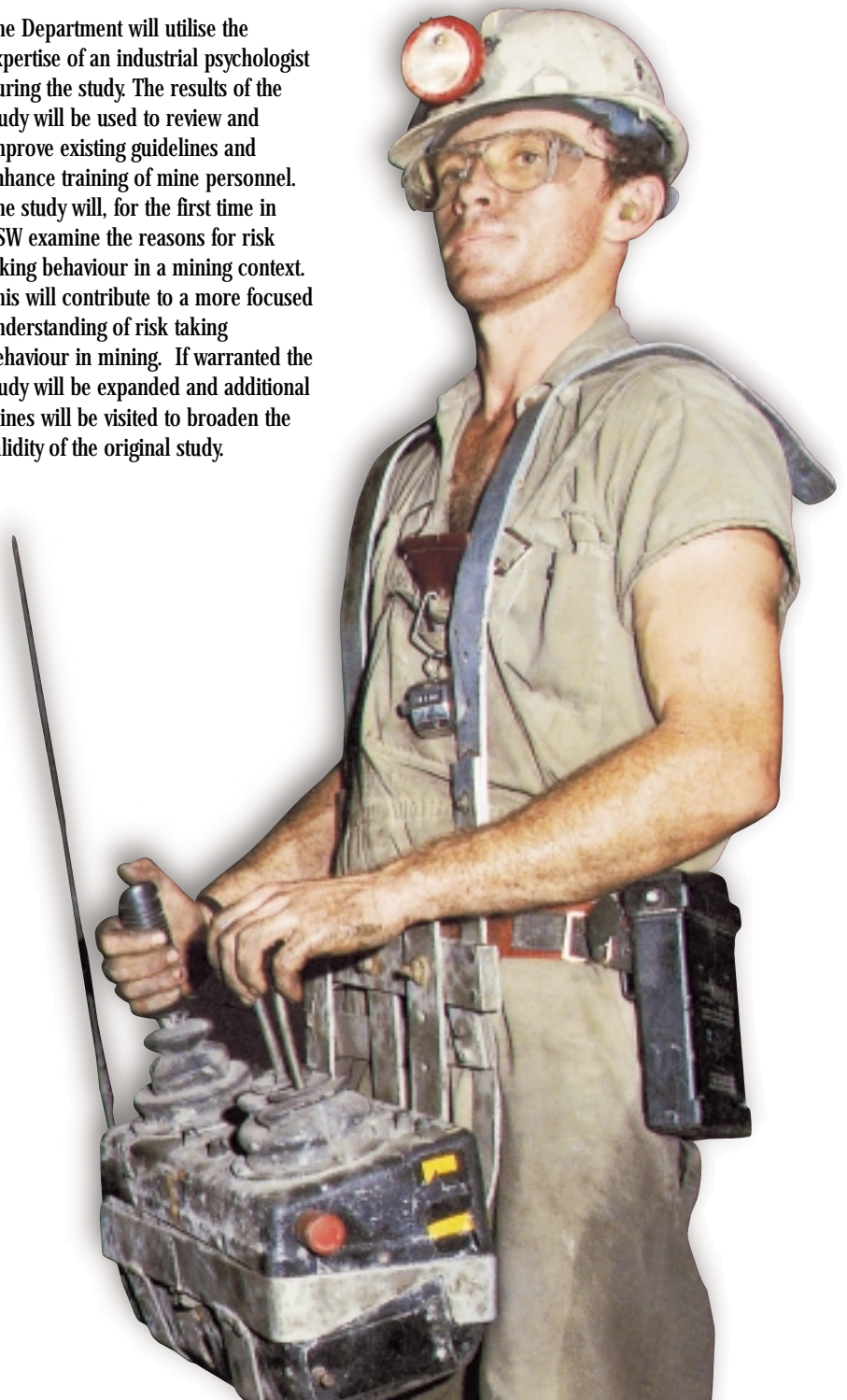
The pilot study will be conducted at 10 mine sites. Examiners will measure and map risky positioning behaviour and identify factors that influence this risk taking behaviour.

There are a number of operations which have expressed an interest in participating in the remote control risky behaviour project. To date, selected operations include:

1. United (Hunter)
2. Dartbrook (Hunter)
3. South Bulga (Hunter)
4. Gunnedah (Hunter/Gunnedah)
5. Newstan (Lake Macquarie)
6. Wallarah (Lake Macquarie)
7. Springvale (West)
8. Berrima (South East)

The initial interview with selected operations commenced on the week of 20 December at the Gunnedah Colliery. Others scheduled for that week included: South Bulga, Dartbrook and United.

The Department will utilise the expertise of an industrial psychologist during the study. The results of the study will be used to review and improve existing guidelines and enhance training of mine personnel. The study will, for the first time in NSW examine the reasons for risk taking behaviour in a mining context. This will contribute to a more focused understanding of risk taking behaviour in mining. If warranted the study will be expanded and additional mines will be visited to broaden the validity of the original study.





GREEN PAPER TO BE RELEASED FOR COAL INDUSTRY COMMENT

The mining industry will be invited to give advice to the Government on reform of the Coal Mines Regulation Act.

Announcing that a Green Paper will be issued for public comment in the first half of 2000, the Minister for Mineral Resources, Eddie Obeid, has

stated that review of the CMRA is a vital step in major reform of the fundamental legislation governing the 80 coal mines in NSW.

A 'Green Paper' is an issues paper released by Government to promote public consultation on important matters. The consultation will be assisted by a series of industry forums on the proposed changes, to be presented in accessible locations in the latter half of 2000.

The Green Paper will be publicised to industry in 2000, and a series of industry forums will be announced through Mine Safety News. ■■

10TH MECHANICAL ENGINEERING SAFETY SEMINAR 29 - 30 MARCH, 2000 AT PENRITH LEAGUES CLUB

To acknowledge safety issues into the new millennium, the Department of Mineral Resources will for the first time, run the 10th Mechanical Engineering Safety Seminar over a two-day period, with a special millennium banquet on the opening night.

About the Conference

Day One will include four sessions based on the traditional format. A full session will be devoted to the issue of safety when maintaining continuous miners and roof bolting machinery. Session material for Day One will include the findings of the NSW and Queensland industry working groups, formed

following fatalities and accidents that have occurred during these activities.

Day Two will run two workshops concurrently. Workshop One will be on Competency Standards for Engineering presented by MITAB. Workshop Two will be on Mine Winder Safety.

Delegates will be able to register for Day One or Day Two, depending on the package they select. The workshops this year are of particular significance to Safety issues for 2000.

About the Workshops

Workshop One: Competency Standards for Engineering

The Coal Mines (General) Regulation, 1999 Clause 9 includes specific requirements for the establishment of standards of both mechanical and engineering practice for mines and declared plant. It also states that

these "standards of engineering practice" must include documented "standards of competency for persons working with relevant equipment at the mine or declared plant".

It is apparent that the establishment of "competency standards" is in need of urgent attention by many mining operations. It is equally apparent that achieving this is generally perceived as a daunting task. Workshop One will go a long way to alleviate some of these difficulties.

Workshop Two: Mine Winder Safety

Mine Winders are the most significant item of a mechanical plant at an underground mine. Failure could have catastrophic consequences. To address this issue the workshop will focus on the safe operation and maintenance of this critical piece of equipment. ■■

**To register for this conference and/or workshop please contact: Steve Stewart,
Telephone: (02) 9901 8413, Fax: (02) 9901 8584 or email on stewarts@minerals.nsw.gov.au**

SAFETY ALERTS: OCTOBER 1999 - NOVEMBER 1999

Report No.	Date	Title
SA 99-17	8 October 1999	Child Fatally Injured by Truck (clarification)
SA 99-18	7 October 1999	Serious Accident involving a Drill Rig
SA 99-19	19 October 1999	Serious Accident resulting from Roof Fall
SA 99-20	12 October 1999	Electric Shock from Damaged Circuit Breaker
SA 99-21	20 October 1999	Burns from Incorrectly Rated Circuit Breaker
SA 99-22	21 October 1999	Serious Accident involving a Hardened Steel Hammer
SA 99-23	8 November 1999	Truck Driver raises tray under Power Lines

CHRIS BROPHY RECALLS 24 YEARS AS AN INSPECTOR

Chris Brophy retired at the end of last year after more than 24 years as an Inspector of Mines in the Southern regions of NSW. On retirement he wrote down his experience of accidents and hazards over the years. Mine Safety News decided to share his invaluable experience and wisdom with the industry.

What causes accidents?

Accidents nearly always originate from system or procedural failure(s) and lack of adherence to these. The significance of such, is most often not recognised until an irregular event occurs such as equipment breakdown. This can then cause practices to be short circuited, maybe only temporarily, but possibly also coinciding with some other temporary deficiency in the operation.

The coincidence of the chronic procedural failure(s) or absence of procedures, irregular event and/or temporary deficiency - sets the stage for an accident. The frequency with which these matters occur at an operation is a direct reflection on the behaviour of the mine management and the cultural habits condoned.

What are the most significant types of accidents?

The most significant serious and fatal accident types which I investigated can be grouped as follows:-

(1) Arm caught in Conveyor Head or Tail Pulleys (Drums)

If the person does not die in the process, often the arm is amputated or at the very least, major reconstructive surgery is required.

This type of accident can result from the stumble, fall, slip situation. Equally it can arise from a direct management instruction to throw fine gravel or belt grip (grease compound) into the nip-point of the moving drum to prevent slipping of the conveyor belt on start up. In each case, management had wrongly decided that drum open nip-points are not a danger to persons and are left unguarded.

(2) Roll-over, Run-over of Mobile Equipment (Loaders, Trucks etc)

The result of these accidents was generally fatal until legislation in the form of two separate General Rules was introduced in the 1980's. They provided for the fitting of a Roll-over Protective Structure on the machine and the wearing of a seat belt by the operator, both to meet the requirements of the relevant



This photo shows the result of a conveyor head/tail pulley accident. Major reconstructive surgery was required by skin grafts from stomach to inside forearm. I was advised that a further four operations would be required, to reconstruct by microsurgery, muscle, sinews and nerves within the arm.

Australian Standards. Where these items were fitted, the severity of the accident was considerably reduced.

(3) Falls of Ground

This can occur in both the underground and open cut situation. With underground, the extraction area must be secured after blasting. In soft ground where mechanical digging equipment is used, the area must be secured as extraction proceeds.

(a) Cyclical Hazard in Hard Rock Open Cuts

During a prolonged dry spell or drought with continual nearby drilling and blasting, cohesive planes such as joints and faults of the rock mass in the benches tend to open up from ground vibration. In normal weather periods, fine grit and dust may blow and wash into these openings tending to seal them. But in times of drought, no such sealing occurs and the openings tend to widen.

In this situation, the predominant force holding the rock mass together becomes the

frictional characteristics of the rocks themselves (ie the weight of one block upon the other). Should a substantial or prolonged fall of rain occur upon the open cut, water will enter these openings, not to act as a lubricant, but to provide an uplift pressure on the frictional forces working to close the joints. If the velocity and volume of water is adequate, failure of the rock mass will occur.

(b) Freezing of clay/fine ore/gravel benches, stockpiles etc.

During winter months where prolonged soaking rain followed by below zero ground temperatures occur, a new hazard develops at an operating face when fine weather returns. Ice in the ground provides additional cohesive shear strength in the working face. As the sunlight plays on the face, the ice melts and the face collapses without warning for the material to rill down to a more natural lower angle of repose. In such circumstances managers need to be aware to keep working faces at a much lower height than in normal operations. I investigated several serious accidents from this origin.

(4) Unprotected Chutes and Wincos

On two occasions I investigated serious accidents from persons falling into open chutes/wincos. One of these was a 10 metre fall, the other of 30 metres and in both instances the persons miraculously survived. In the first instance a young mining engineer, inadequately inducted by site training on systems and procedures, drove a diesel powered personnel carrier into blasting smoke. Because of the thickness of the smoke he stopped his vehicle deciding to continue on foot. Alighting from the vehicle, he took a couple of steps and fell into a 10 metre open winze causing two fractures in his neck, lacerations and contusions to his back and head.

In the second instance a miner carrying some equipment, stepped from the bottom of a ladder way onto a sub-level where his job site was located. There was some broken ore piled at that point in front of a chute. He stepped onto the rill of ore which moved under his feet and he fell into the undecked chute, landing in a scram drive 30 metres below. He suffered bruising, lacerations,



shock and suspected cracked vertebrae.

(5) Poor Maintenance Practices with Mobile Equipment

There were instances I investigated with operators of mobile equipment, where the cause of the accident was traced to particulate contamination of hydraulic steering fluid. On one occasion the steering of an off-highway truck suddenly locked while travelling along a quarry bench. Because the truck was fully loaded, full braking was insufficient to prevent the truck from running over the edge. Cleanliness of the workplace when changing hydraulic fluid in mobile equipment is of paramount importance and managers need to be particularly vigilant where servicing is carried out by contractors, especially if done off site.

(6) Contact with Electric Power

On one occasion I investigated a serious electrical accident where an addition to the crushing and screening plant was being erected at a quarry site. A boiler-maker was walking behind a mobile jib crane, holding and steadying a fabricated steel conveyor

to his badly burnt left hand leaving him only with pincer movement between his thumb and paralysed fingers. In all he underwent 16 separate hospital operations.

The boilermaker had been employed by the contractor carrying out the construction work. Upon investigation it was found:-

- (a) No thorough pre-examination of the site had been carried out either prior to bringing the crane onto the site or setting it in position.
- (b) No attempt had been made to de-energise the 22,000 volt lines or protect them by fencing, or to provide such buffers, stops or devices to prevent any part of the crane from coming within close proximity of the lines.
- (c) There was no notice in the operator's cabin, warning of electrical hazards in connection with the operation of the crane in the presence of electrical apparatus.

What can be done to prevent accidents?

I believe the best approach is for management to initially conduct a self-assessment from the chart accompanying the Verification Booklet "Be Aware-Be Safe" series. Following self-assessment on each of the 10 programs of the chart, a comprehensive long-term improvement program should be drawn up so that all aspects of the mining operation are included in progressively moving from minimum compliance to best practice.

To ensure success, the process of

commitment to improvement must be driven from the top of the organisation and be subject to regular internal review.

Management must be forever vigilant to ensure systems and procedures continue to function within set safety standards. This is especially important when a significant change occurs in the operation (eg: a changeover of contractors, a new method of winning ore or the processing of same). Risk assessment techniques should be appropriately introduced at such times. Some advice from external OH&S consultants may be required in this regard to assist in achieving particular goals.



Chris Brophy Retires

Prior to joining the Mines Inspection team, Chris was employed in the mining industry at Broken Hill in his first discipline, metallurgy, until he completed his second degree and transferred into mining engineering. Later he became a part time lecturer at University College, then operating out of Broken Hill, where many engineering students are trained. Chris commenced duties in Wagga Wagga in 1975 and in the following years he worked under three Chief Inspectors, eight Ministers and in two Departments, while essentially continuing to perform the same role.

Never frightened to take on recalcitrants, Chris continues to hold the record for the highest individual number of successful prosecutions undertaken by the Inspectorate.

Chris and Joy plan to stay in Wagga Wagga where they are well established. Chris will continue to pursue his lifelong love of flying, now in his own aircraft, a Piper Tomahawk, acquired and restored during the last three years.

The Department of Mineral Resources wish them continued clear skies and tail winds.

The boilermaker survived the shock although he was completely disabled for the rest of his life. His steel capped boots had literally melted into his feet.

frame hanging from the jib when the latter contacted bare 22,000 volt overhead lines.

His right toes and left leg below the knee were later amputated. His right arm was also amputated below the elbow and a circumferential flap of flesh had to be grafted



Photographs - compliments of Chris Brophy

Toyota Landcruiser struck by a 150 tonne fall of rock at a hard rock open cut. The fall occurred following rain after prolonged drought. The body of the shift boss driver had to be cut from the vehicle

MINING INDUSTRY TACKLES HEALTH RISKS FROM DIESEL EXHAUST

The Minister for Mineral Resources, Eddie Obeid, has stressed in parliament the importance of addressing diesel emissions.

Mr Obeid's comments were sparked by reports from the Department of Mineral Resources, the NSW Minerals Council and the Joint Coal Board all stressing the need to control emissions from diesel engines, particularly underground and in confined spaces.

It coincided with Federal negotiation with the petroleum industry which will significantly improve quality control for diesel fuel.

The Department of Mineral Resources has published a special report to provide an overview of current diesel fuel specifications and fuel quality, reporting on Australian and International directions. The report is to be used by Mining Inspectorate and Managers of Underground operations to review and determine appropriate fuel specifications.

Any queries on the report - A Review of Diesel Fuel Quality for the NSW Underground Coal Mining Industry - should be directed to Grahame Fawcett, Laboratory Manager, telephone (02) 9646 1644.

This report issued by the Department of Mineral Resources complements the recently released 2nd edition of the publication "Diesel Emissions in Underground Mines" produced by the NSW Minerals Council.

The NSW Minerals Council: Guidelines

"The Council first published guidance material on reducing diesel emissions in 1996 and this has done much to raise awareness and to improve management practices in the NSW mining industry", said Mr Denis Porter, Executive Director of the Council.

"Exhaust from diesel engines contains literally thousands of chemical compounds. Research has indicated that exposure to high levels of diesel exhaust can cause a range of adverse health effects from dizziness and irritation of the eyes and throat, to chronic lung diseases" said Mr Porter.

"Where multiple diesel engines are used in the confined environment of an underground mine or engineering workshop, action needs to be taken to ensure the health and safety of mine workers."

"We now have many examples of NSW mining companies taking the initiative on this issue. In fact, NSW mines are at the forefront in developing and adopting best practice technologies to monitor and reduce levels of diesel emissions. We receive requests for our booklet from all over the world".

The updated edition of "Diesel Emissions in Underground Mines – Management and Control" has been developed by a working group of experts from industry, unions, government and manufacturers of diesel powered mining equipment.

The booklet contains an expanded range of innovative and practical methods to reduce worker exposure to harmful levels of diesel emissions, based on research and actual practices at NSW mines.

"The Council strongly urges underground mining companies to use the booklet in assessing whether their workers are at risk from health problems due to diesel exhaust

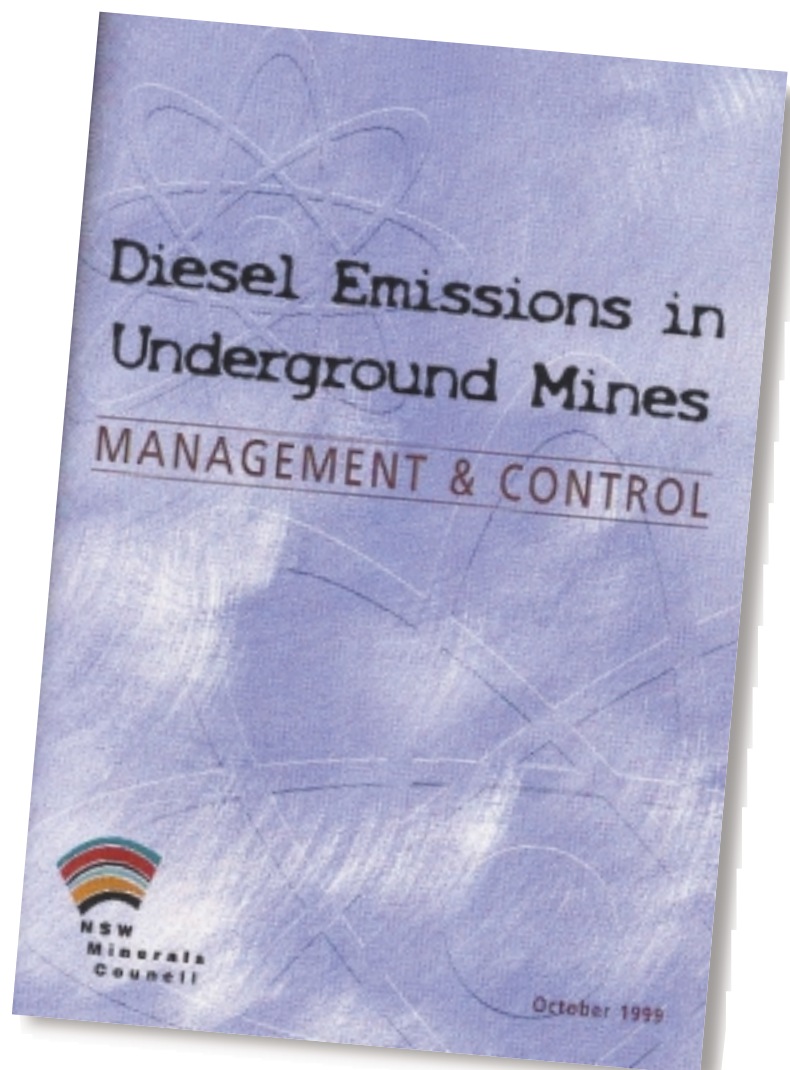
and to implement measures to reduce these risks as part of their overall health and safety management systems" said Mr Porter.

The Guidelines have been distributed free of charge to all NSW underground mines (coal and metals). Additional copies are available from the NSWMC at \$20 per copy. This includes postage and handling. ■■

For further information and copies of the booklet please contact:

Robyn Hodges, Health and Safety,
NSW Minerals Council in Sydney,
telephone (02) 9267 6488

Alternatively the Diesel Guidelines are available to download (free of charge) from the health and safety publications area of the NSWMC web site on www.nswmin.com.au





PIONEER'S NEW SOUTH WALES OPERATION SHINES IN SAFETY AWARDS

Pioneer International Limited's Directors' Award for the highly contested Best overall health and safety performance was this year awarded to Pioneer's New South Wales operation. CEO of Pioneer International, Dr John Schubert made the award presentation at a celebration held in Sydney last December.

The Directors' Awards recognise safety and environmental excellence within the Pioneer group. This year 57 entries were received from Pioneer operations throughout USA, Europe, Asia and Australia.

Speaking on behalf of Pioneer's New South Wales employees, General Manager for New South Wales Les Cadzow, said that the win was terrific recognition of the exceptional level of enthusiasm and commitment to safety

by the business unit's 600 employees and 300 permanent contractors.

"Through an innovative, well-planned and long-term approach to safety management, Pioneer's New South Wales concrete, quarry and transport operations have demonstrated an outstanding and sustained improvement in safety performance over the past six years," said Mr Cadzow.

The business unit's strategy includes firm safety leadership, a very high level of employee commitment, implementation of comprehensive safety systems, outstanding communication programs and a high level of employee empowerment and accountability.

In addition, Pioneer's NSW operations instituted two-day safety seminars attended by all levels of their workforce. These workshops and seminars brought together different work disciplines, e.g. drivers, office workers, concrete batchers, and looked at the specific safety aspects of different parts of

the business. More importantly the seminars demonstrated to those attending that safety awareness applies to everyone, in every part of the business, regardless of the job each person undertakes.

For the past two years Pioneer Concrete in NSW has run a Safety Week that is organised by employees and permanent contractors. The week is used to highlight and promote various safety initiatives, such as the wearing of orange and green safety vests for people working around vehicles, and campaigns to promote the wearing of seatbelts.

During the week there are talks on a range of safety topics, personal health checks along with lighter activities such as competitions for employees and contractors' children.

The aim of Pioneer's Directors' Awards, now in their fifth year, is to promote the transfer of knowledge within the group internationally and to recognise employee and contractor contributions and endeavours in safety and environmental management.



Photograph - compliments of Pioneer International Limited

From left, Les Cadzow, General Manager for NSW, John Schubert CEO and Leanne Parker, OH&S Manager for NSW proudly display the Directors' Award trophies presented to NSW.

NATIONAL MINE SAFETY CULTURE SURVEY

The Minerals Council of Australia has undertaken a National Mine Safety Culture Survey to assess the attitudes and values of the mining work force. The data from the survey can be used to identify and prioritise strategies which may be aimed at improving a range of outcomes such as: job satisfaction, communications, productivity and safety.

Who participated in the survey?

6718 people from 42 participating mines, plants and refineries completed the survey, making it the largest survey of its kind in Australia. At many sites the entire work force completed the survey.

The sample proportionally represented each State and Territory, industry sectors (ie, coal, gold and other mining), mining methods (ie, underground or surface) and mine size (based on the number of employees).

Different employee groups were also proportionally represented in the sample, including managers, specialist staff, supervisors, operators and contractors.

What did the survey measure?

In general terms the survey measured "safety culture". This refers to the set of shared values, beliefs and assumptions which guide and influence actions and behaviour at work, which in turn influence safety performance.

Participants were asked to agree or disagree with 41 statements on aspects of safety culture, grouped under eight broad factors, as outlined below.

- Organisation – perceptions of their company's overall attitude and commitment to safety (eg, "this company is very serious about safety").
- Management – perceptions of the attitudes and commitment of their senior managers to safety (eg, "management listens to our views on safety").
- Supervision - perceptions of the attitudes and commitment of their direct supervisor to safety (eg, "my supervisor always puts safety first").
- Management Processes – perceptions of the effectiveness of management processes that affect safety such as consultation, feedback and decision-making (eg, "if you raise a safety concern, someone follows up very quickly").
- Safety Systems – perceptions of the effectiveness and quality of safety manage-

ment processes such as safety standards, systems and training (eg, "Safety training in this company is of a high quality").

- Job Factors – perceptions about their own jobs and work activities (eg, "my tool and equipment are generally safe and well maintained").
- Team Factors – perceptions about the team in which they work (eg, "people around me generally comply with safety rules").
- Individual factors – their personal attitudes to safety at work (eg, "it is possible to achieve zero accidents").

An electronic survey method was used. This method allowed respondents to participate regardless of their literacy skills. It also made true confidentiality possible.

WHAT DID THE SURVEY FIND?

Some of the observations arising from the national survey results include:-

- The industry's success in communicating its commitment to improving mine safety may be undermined by perceptions that management does not sufficiently value or care about their workforce in a broader sense.
- Perceptions that the emphasis on safety is a reaction to external pressures, rather than a genuine desire to achieve improved safety outcomes. This further outlined the need for strategies to address the lack of credibility of management groups.
- Widespread job insecurity in the industry may hamper well-intentioned interventions and efforts to achieve improved safety.
- All employee groups indicated high levels of dissatisfaction with the quality and relevance of safety management systems and safety training.
- Safety committees received relatively low levels of support from management groups, which may reduce their effectiveness.
- There were very high levels of positive regard for the work of on-site safety professionals especially among management groups.
- There is a need to improve formal and informal processes for recognising and acknowledging safe work.
- In contrast to managers, a significant proportion of employees were skeptical about whether the goal of "zero accidents" is achievable.

- Beliefs in the inevitability of accidents, pressures to expedite work, deficiencies in processes for recognising safe work and inaccurate perceptions of risk levels, may combine to influence levels of risk-taking behaviour.
- Relationships within work teams and relationships with direct supervisors were consistently viewed as positive and may provide opportunities to develop and improve safety initiatives.
- In contrast with common perceptions, the responses of contractors were generally more positive than employees, and there was little difference between the response of underground and open cut groups.
- Smaller mines consistently showed more positive responses than larger mines across all employee groups, perhaps due to their ability to achieve closer contact between levels of the workforce.
- Employee perceptions of company and management credibility and commitment to safety, were significantly lower in coal mines compared to metalliferous mines, perhaps reflecting recent coal industry restructuring and its turbulent industrial relations history.

Where to next?

The survey is a rich source of data which can be used by mine safety and human resource professionals to develop and review their improvement strategies. The results highlight specific areas of concern which individual companies, industry groups and inspectorates may wish to direct further attention and research.

The Minerals Council of Australia is developing strategies to promote discussion and understanding of the survey results across the Australian mining industry. Strategies to date will include special seminars, conference sessions and further research into priority areas.

In addition, the NSW Mine Safety Council will formally consider the survey report and identify strategies to foster the development of a positive safety culture across the NSW mining industry.

Article written by - Robert Oliver, Manager, Health and Safety, NSW Minerals Council.

The Safety Culture Survey Report can be ordered or downloaded from the Minerals Council of Australia at www.minerals.org.au.



KEY PLAYERS IN THE NSW COAL INDUSTRY

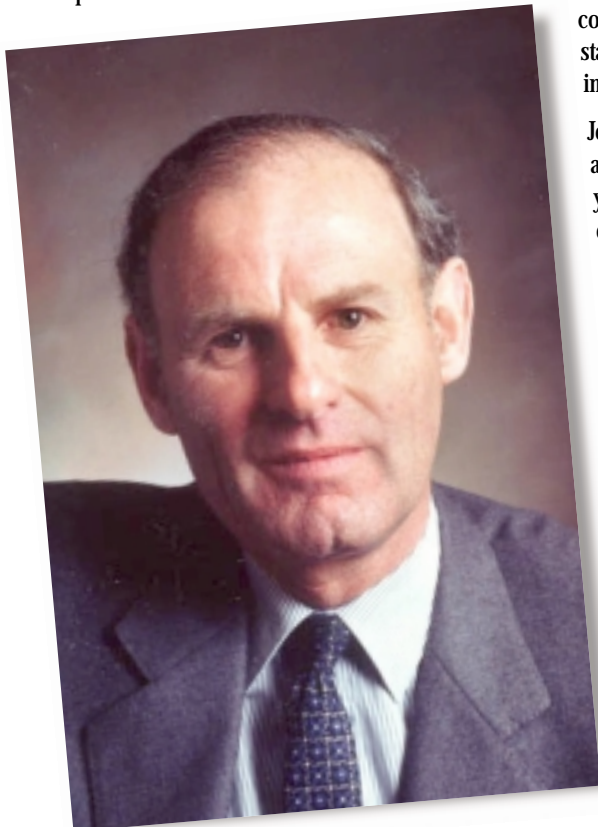
Bob Humphris

Bob Humphris was a key member of the NSW Mine Safety Review's Steering Committee and has continued to provide leadership as a member of the NSW Mine Safety Council.

In addition, Bob is Chairman of the New South Wales Minerals Council, past chairman of the Australian Coal Association, a Director of Australian Coal Research Limited, a Director of Port Waratah Coal Services and Chairman of Newcastle Coal Shippers. He is also a member of the International Energy Agency, Coal Industry Advisory Board.

He holds an honours degree in Mining Engineering from the Royal School of Mines, London University and is a Fellow of both the Australian and U.K. Institute of Mining and Metallurgy.

Today, Bob Humphris is Managing Director of Peabody Resources Limited, and is responsible for Peabody's operations in Australia. These consist primarily of three major open-cut mines in the Hunter Valley of New South Wales together with a fourth in Queensland which also produces commercial quantities of coal seam methane, as well as a mining services division based in Brisbane which specialises in



Bob Humphris

underground contract work such as tunnelling.

He has been a director of Peabody Resources for 18 years, a resident of Australia for 27 years and with the Company for 29 years. Prior to that he worked for Alcan in South America.

John Maitland

John Maitland is one of Australia's most well-known trade union leaders. John was a key member of the Mine Safety Review's Steering Committee which handed over, for continuation of strategic direction of mine safety, to the Mine Safety Council.

In 1998 John assumed the title of National Secretary of the Construction, Forestry, Mining and Energy Union. The CFMEU is a union of more than 120,000 people and one of 17 major industry-based unions in this country. As National Secretary he is the spokesperson not only for most unionised workers in Australian mining, but also in the construction industry, power stations, the forestry and pulp industry and some oil refineries.

John led the CFMEU's Mining and Energy Division for many years and was General President of the Miner's Federation - the main predecessor of the CFMEU's Mining and Energy Division. He took up that position in 1985, after having served five years as the Secretary of the Queensland branch.

He first joined the coal industry in 1968 after a brief career as a professional footballer. He was first employed at the Blackwater mine and then went to Collinsville after being retrenched.

John has given a lifetime to the trade union



John Maitland

movement and progressive causes. In November 1999 he became President of the Brussels-based International Federation of Chemical, Energy, Mine and General Workers' Unions which cover some 20 million people in 114 countries.

He is on the National Executive of the Australia Council of Trade Unions.

In 1995 he led workers representatives from around the world in the successful negotiation of a new international convention on safety and health in mines at the International Labour Organisation. One of his current campaigns is to get Australia, as one of the world's leading mining nations, to ratify this convention.

New Announcements

Alastair Fotheringham

The new Chairman of the Coal Compensation Board is Alastair Fotheringham. He took up his new position with the Coal Compensation Board on 1 November 1999. Previous to this he was the General Manager of ANZ Bank. He started his career with the bank as an economist.

The Coal Compensation Board was established in 1985 to compensate former owners whose coal was acquired by the State in 1981. The Board has paid out over \$540 million since its formation.

MAJOR MINING EVENTS FEBRUARY - DECEMBER 2000

FEBRUARY Mon 7 - 13

Mechanical Engineer-in-Charge Meeting
Venue: Stratford Coal
Contact: Craig Sorensen, Stratford CHPP,
(Chairman)
DMR contact: Leo Roberts, Ph (02) 9901-8550

FEBRUARY Mon 14 - Tues 15

Global iron ore & steel forecast
Venue: Sheraton Hotel, Perth.
Contact: IBC Conferences
Ph (02) 8235-5300

FEBRUARY Thurs 24 - Fri 25

Longwall mining summit
Venue: Rydges Capricorn International Resort,
Yeppoon, Qld
Contact: IBC Conferences
Ph (02) 8235-5300

FEBRUARY Tues 29 - MARCH Wed 1

Doing business with Aboriginal communities
Venue: Carlton Hotel, Darwin.
Contact: IAC Worldwide
Ph (02) 9210-5784

MARCH Wed 15

Tailings - corporate risk & responsibility
Venue: Hotel Intercontinental, Sydney
Contact: Australian Centre for Geomechanics,
WA
Ph (08) 9380-3300

MARCH Mon 20 - Tues 21

Inaugural Light Metals Summit
Venue: Parkroyal Hotel, Darling Harbour,
Sydney.
Contact: Centre for Mining & Energy
Ph (02) 9210-5777

MARCH Tues 21 - Thurs 23

Science 2000, scientific & lab exhibition
Venue: Rosehill Gardens Function Centre,
Sydney.
Contact: Scientific Suppliers Association of
Australia
Ph (02) 9804-8051

APRIL Sun 9

9th International Conference & Exhibition on
Pressure Vessel Technology
Venue: Hilton Hotel Sydney
Contact: Lucien Kent, WorkCover
Ph (02) 93705000

APRIL Mon 10 - Wed 12

After 2000 - the future of mining,
Venue: Australian Technology Park, Redfern,
Sydney
Contact: Australian Institute of Metallurgy
Ph (03) 9662-3166

APRIL Mon 10 - Wed 12

Australian Gold Conference 2000
Venue: Burswood Convention Centre, Perth.
Contact: Chamber of Minerals & Energy of WA
Ph (08) 9325-2955

APRIL Tues 11 - Fri 14

National Manufacturing Week MegaShow
Venue: Sydney Convention and Exhibition
Centre
Contact: Chris Ghosh
Ph (02) 9422-2518

MAY Tues 2 - Thurs 4

NT gold & mining exhibition & conference
Venue for Exhibition: The Foskey Building,
Darwin Showgrounds

Contact: Ph (07) 3399-6961
Venue for conference: MGM Grand Casino,
Darwin
Contact: Ph (08) 8985-12909

MAY Fri 19 - Sun 21

Annual Extractive Industry Safety Symposium
Venue: Salamander Shores, Port Stephens
Contact: Danny Duke, The Institute of
Quarrying Australia, NSW Branch
Ph (02) 9928-3653

JULY Tues 25 - Thurs 27

QLD Mining & Engineering Exhibition
Venue: Mackay Showground, Mackay QLD
Contact: Ph (02) 9422-2511

AUGUST Mon 7 - Wed 9

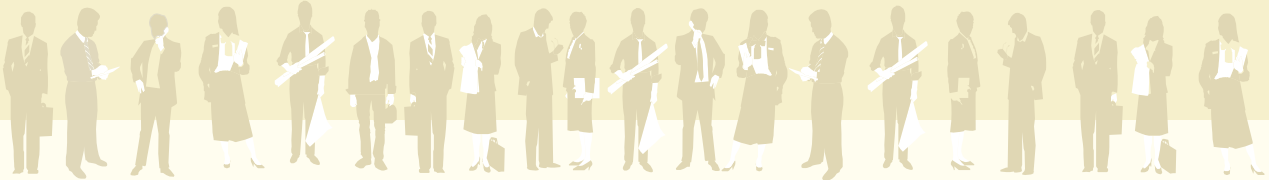
Resources Week Conference & Exhibition
Venue: Adelaide Convention Centre &
Exhibition Hall
Contact: Staffords Conference Management,
Ph (08) 8364-1100

SEPTEMBER Sun 3 - Fri 8

Mine Safe International
Venue: Burswood Hotel, Perth, WA
Contact: Chamber of Minerals and
Energy of WA
Ph (08) 9325-2955

SEPTEMBER Mon 11 - Wed 13

Minprex 2000, international congress on
mineral processing & extractive metallurgy
Venue: Carlton Crest Hotel, Melbourne
Contact: Australian Institute of Mining &
Metallurgy
Ph (03) 9662-3166



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