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Government of **Western Australia**
Department of **Mines and Petroleum**
Resources Safety

Supervision key to safety

MANAGING FATIGUE

HAZARDOUS OR DANGEROUS?

SURFACE MINE EMERGENCY RESPONSE COMPETITION

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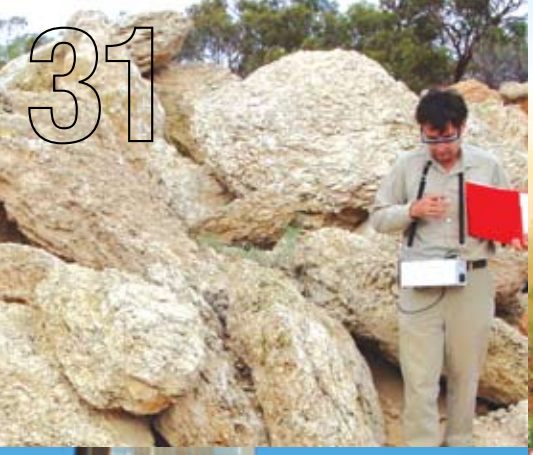

Welcome to the second issue of *MineSafe* for 2009. And thank you to all the readers who provided feedback on the new reader-friendly format, which has been extremely well received.

This is a bumper issue, expanded to cover the 2009 Surface Mine Emergency Response Competition, an important event on the mining safety calendar. It also includes the ten significant incident reports and safety bulletins issued by Resources Safety since May.

Simon Ridge, Director Mines Safety, has taken over from Martin Knee as the State Mining Engineer, effective 1 October 2009. His thoughts on safety issues are presented in the new "Simon says" section.

Martin Knee, State Mining Engineer from 2001 to 2009, has significantly contributed to mining safety in Western Australia in an official capacity for over 23 years. His contributions will be acknowledged in the next issue of *MineSafe*. On behalf of the Department, I want to thank Martin for his tireless efforts to improve industry safety performance and wish him well in his retirement.

As always, enjoy your reading.

Malcolm Russell
Executive Director, Resources Safety

NEW DIRECTOR GENERAL READY FOR THE CHALLENGE

During its short lifespan, Western Australia's Department of Mines and Petroleum (DMP) has been tasked with overseeing some major changes to the State's resources industry. From overhauling the approvals process for new projects, to administering the A$80 million Exploration Incentive Scheme, and fine-tuning the regulatory regime for the introduction of uranium mining, DMP's staff has been busy since the January inception. These changes have come about amid, and to some extent because of, a global economic climate that has been on a downward slide for most of the year.

As the new Director General of DMP, Richard Sellers is aware significant challenges lay ahead. Nonetheless, he believes the State is well placed to emerge stronger and well placed from the current gloom.

Mr Sellers took over from acting Director General Tim Griffin, Director of the Geological Survey of Western Australia, and is returning to his home State after a decade in the Northern Territory. In his most recent position as the Territory's Executive Director of Minerals and Energy, Mr Sellers filled a similar role to his new Western Australian post.

Mr Sellers said that the formation of DMP had provided a clear focus for staff and industry on the business of the department, and that staff were already working hard to improve outcomes for Western Australia.

"I am impressed with the work already commenced to address the issues with the approvals process, such as the ability for proponents to track the progress of their approvals for environment and petroleum, which was launched in early July," he said. "This change is already getting positive feedback from industry, and a similar program for other areas should be available by December 2009.

"Clearly, DMP is committed to further improving its high customer service levels. We all want to see projects go forward with appropriate environmental and safety outcomes."

The Northern Territory and South Australia are the only two Australian jurisdictions in which uranium is currently mined, and Mr Sellers had extensive involvement in the regulation of the Territory's Ranger mine and the uranium exploration boom of the past few years. It is experience he can expect to draw on as Western Australia moves to become the third Australian uranium producer, after the State Government lifted the ban on uranium mining in November last year.

"In the Northern Territory, I worked with uranium through the boom, and companies that are active in Western Australia are, in the main, the same companies that I worked with in the Territory," Mr Sellers said.

He said Western Australia could focus on uranium because of the advanced stage of existing proposals, and as it was among only a handful of commodities that were bucking the trend of falling prices.

"Gold and phosphate, just to name a couple of others, are also holding their own," he said.

Mr Sellers believes these and other positive trends have created a level of optimism for Western Australia that may be lacking in other areas.

This opinion has also been borne out from past experience, and recent positive job growth statistics in the resources sector.

"You can see some stirrings of change in there already," he said of the current economic climate. "I am not talking about ignoring the current hard times but of trying to prevent the bottom of the cycle being as low as it might be otherwise, and if we can do that then it will set us up well for the future."

One initiative sure to feature prominently in those strategies is the A$80 million Exploration Incentive Scheme, which was unveiled in April this year. The five-year Royalties for Regions-funded program aims to provide a significant boost to exploration activity in the petroleum and mining industry, particularly in greenfield and frontier areas. Its components include a co-funded drilling program that will allow companies and research groups drilling in greenfield areas to apply for subsidies of up to A$150,000 per project.

The scheme will also provide a wealth of new geophysical datasets to industry through the Geological Survey. Mr Sellers said it was a very positive step.

"You really need to have exploration now to have projects in any sort of timelines in which they are going to be able to take advantage of the next cycle," he said. "It has proven very successful in South Australia with its Program for Accelerated Exploration, and in the Northern Territory, with its Bringing Discoveries Forward scheme. In Western Australia, there is not only the money to make it work but also the assets that will get industry excited and wanting to get out there and explore.

"Another pressing issue is the recent tragedies and near misses in the mining sector. The Minister has been clear in his reaction that he sees a need for change in how DMP manages resources safety."

Mr Sellers said that Resources Safety staff had been working on the outcomes of recent reviews, the principles discussed in the National Mine Safety Framework, and experiences in other jurisdictions to prepare a proposal for best practice approach to improve safety regulation. This initiative will be implemented as a priority over the coming months.

Mr Sellers previously held a number of senior positions for the fisheries departments in both Western Australia and the Northern Territory. He has worked in various parts of Western Australia and also spent time in East Timor and Indonesia. The move back to his home State has been a personal, as well as professional, choice.

"I'm particularly pleased to be coming back to Western Australia," he said. "I grew up here and, on a family note, I have two young girls, the eldest in Year 11. I'm pleased that they will be able to finish their schooling here and to make the most of all the opportunities that come from living in Perth.

"There's no doubt that the Territory has been very good to me. I had a good ten years there and I am looking forward to putting in the same effort and doing the best I can for Western Australia."

TRACKING IMPROVES FOR RESOURCES SECTOR

As part of the State Government's drive to improve Western Australia's approvals processes, proponents can now track their applications for environmental assessment through the Department of Mines and Petroleum's online Environmental Assessment and Regulatory System (EARS).

The new system improves the transparency of the application process and enables the Department to identify where the process can be expedited.

EARS is not the only step the Department has made recently to improve its approvals processes.

The Petroleum and Geothermal Register (PGR) has been upgraded and gives petroleum and geothermal proponents the ability to track online their applications.

Mines and Petroleum Minister Norman Moore said these online systems were another example of how the Department of Mines and Petroleum was improving Western Australia's reputation in the resources sector.

"Improving the efficiency and transparency of the approvals processes across all agencies has been one of this Government's highest priorities since coming to office," Minister Moore said.

"The new EARS and upgraded PGR allows proponents to track their application online and identify at what stage it is in the approvals process. This is the first such online system in Australia.

"These changes address issues identified by the Auditor General as problems with tracking applications across the various government agencies involved in the approvals process. They will give applicants further certainty and provide the system with greater transparency.

"I have made it clear since the creation of the new Department of Mines and Petroleum that WA must improve its approvals processes and restore its reputation as the best resource investment destination in the world.

Photo courtesy Hammersley Iron

> IMPROVING THE EFFICIENCY AND TRANSPARENCY OF THE APPROVALS PROCESSES ACROSS ALL AGENCIES HAS BEEN ONE OF THIS GOVERNMENT'S HIGHEST PRIORITIES SINCE COMING TO OFFICE

"Online systems such as EARS and PGR are major steps towards achieving this."

The Minister said that a pilot group, including Western Australia's major resource companies, had tested EARS in early June and provided positive feedback.

EARS is accessed online through the Department's website by a proponent using a secure login, unlike the PGR, which has full public access and only requires a secure login for on-line payments.

The systems show whether an application is under assessment by the Department or another agency, if it is on hold, and whether it has been approved, rejected or withdrawn from the process. Proponents can print reports on their applications in PDF or Excel format.

Since the introduction of these systems, the Department's latest approvals performance figures for the June quarter have been released.

They show a continued decrease in the backlog of mining-related applications, despite a 57 per cent increase in the number of applications received compared to the previous quarter. There was also a decrease in the number of petroleum applications received.

The report also shows that:

- some 92 per cent of mining environmental approvals were processed within the timeline target of 30 business days, up from 86 per cent;
- all petroleum environmental approvals were processed within the timeline target, also up from 86 per cent; and
- for petroleum tenure applications, 88 per cent were processed within the timeline target, compared to 83 per cent for the previous quarter.

Tracking capabilities have been introduced internally for mineral tenure applications. It is expected that the performance figures will be made available to industry by the end of 2009.

The latest approvals performance report can be accessed at **www.dmp.wa.gov.au** in the "Approvals/Licences" section.

SUPERVISION KEY TO WORKPLACE SAFETY

Let us consider where Western Australia's mining industry is positioned at present in regards to safety performance. In recent times there has been a significant worsening in some aspects of our industry's safety performance. Although there has been a steady decline in lag indicators such as the lost time injury frequency rate (LTIFR) have steadily declined, the incidence of fatalities has shown a high degree of volatility (see "Crunching the numbers").

In 2008-09, the State had a greater than three-fold increase in fatalities from two to seven per year. The only acceptable figure is zero. None of the victims of these accidents expected it to happen to them. We must also acknowledge that the victims are numerous — they include the deceased's family, friends and work mates. The knock-on effects spread like ripples on a pond and have long lasting consequences for all involved.

This most terrible of trends has occurred when many believed that industry was on the right track, with the LTIFR at historic lows despite major increases in production and workforce levels. Despite the global downturn, the Western Australian mining sector currently employs about 69,000 workers, of which more than half are contractors — about 38,000 at the last count (see "Crunching the numbers").

Why has there been this disastrous downturn in safety performance? What has changed? Has anything actually changed? Have we been living with a false sense of security? What can be done about it?

I believe we must go back to basics. The accidents are happening in the front line so we must look there to identify the causal factors. After all, very few army generals appear on the war memorials — it is usually the privates and non-commissioned officers who have their names recorded for posterity.

In recent months, the mines inspectorate has scrutinised various operations around the State as we followed up on high potential incidents and fatal accidents. Two fundamental factors were identified for immediate attention — supervisor presence on the job and worker participation in the safety management process.

The face of mine supervision has changed over recent years. Economic rationalism has streamlined operations and safety management systems now demand a consistent paper trail. This has apparently reduced the presence of supervision at the "coal face".

Supervisors are spending a significant amount of time attending meetings and producing compliance paperwork. Anecdotally, this has apparently reduced time spent in the field monitoring conditions and compliance with standards on the job. This does not mean that the work being done completing paper work or attending meetings is not essential or relevant. Rather, the real questions are who should be doing what and when? Could it be that supervisors need additional support in these areas, are all of the meetings necessary, do we keep to the agenda and use

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our time wisely? These are all questions that need to be asked and answered.

Supervisors need to get back to the basics. In the mid 20th century, safety management systems were not as complex. For example, in the 1970s I was introduced to the Quebec Safety System, which is about as simple as you can get. It comprised five dot points aimed directly at supervisors:

- Check entrance and travel way.
- Are workplace and equipment in good working order?
- Are employees working properly?
- Do an "act of safety".
- Can and will employees continue to work properly?

Although this system may seem simplistic, these five points provided a good guideline for supervisors and the system has all the components that one would expect of a modern safety system, such as:

- a primary assessment of the immediate workplace environs;
- an assurance that the methods and tools in use are appropriate;
- safety leadership by example; and
- an assurance that things will continue in the right vein.

The business of safety does not have to be cloaked in mystery and reams of paperwork.

Adding to the situation is a lack of awareness on the part of many supervisors as to the rights and functions of elected safety and health representatives. There is evidence that safety committee meetings have, in some cases, become over represented by management when safety and health representatives are not released from the workplace to attend. Similarly, some supervisors are failing to allow safety and health representatives to conduct their monthly safety inspections or to take part in a meaningful way in investigations. We can only expect to provide healthy and safe workplaces if there is meaningful input from the shop floor, particularly through the safety and health representatives, and by ensuring that supervisors spend significant time actually supervising.

I strongly suggest that, at the operations level, management takes the time to analyse supervisor intervention on the job and the effectiveness of safety and health representatives' participation in the safety management processes in the workplace.

As a footnote, at a recent forum it was suggested that safety should not be a priority but a core value — that is, Safety with a capital "S". This is where we must aspire to be, working within a culture that has safety grafted into its very being. Safety must become non-negotiable, automatic and inseparable from everything that we do.

An ongoing contribution from everyone — from the working face to the boardroom — is required to eliminate the tragedy of a fatal incident from the workforce.

Simon Ridge, *State Mining Engineer*

WORRYING TREND FOR CERTIFICATES OF COMPETENCY

A worrying trend has been noted by the Board of Examiners that suggests some candidates for the various certificates of competency law examinations are failing due to poor preparation.

Data analysed by the Board dramatically illustrate the steady decline in the percentage of candidates passing the various law examinations associated with their applications for a Quarry Managers Certificate of Competency.

A similar picture is evident when the data for First Class Mine Managers or Underground Supervisor law examinations are analysed.

The Boards of Examiners have considered this trend. There has been no material difference in the setting or marking of the law examination papers, so the conclusion reached is that candidates are failing to prepare properly.

Candidates are therefore advised to ensure adequate preparation for the law examinations, whether by private study or attending the available short courses. Candidates should develop a self-paced revision program over several months that includes familiarisation with past exam papers and self testing. Remember, there is no substitute for hard work, there are no short cuts, and luck is unlikely to play a part in achieving a pass.

With the advent of the *Dangerous Goods Safety Act 2004* and regulations, the Board would also like to remind candidates that future examinations will, from time to time, include questions relating to those parts of this new legislation related to the transport, storage and use of explosives on mine sites.

INSIDE FOI

Resources Safety receives around 50 requests each year from employees and employers for copies of documents relating to accidents on mine sites.

Documents supplied to or prepared by the mines inspectorate are not publicly available and requests from members of the public for access to documents in our possession can only be considered under the *Freedom of Information Act 1992* (the FOI Act).

The FOI Act requires requests to:

- be in writing;
- give enough information to enable requested documents to be identified;
- give an address in Australia for correspondence; and
- be mailed to or lodged at any office of the Department.

The request has to be accompanied by a $30 application fee, and there may also be charges for processing the request and photocopying. No application fee or charges apply if an applicant is requesting access to personal information about themselves.

If we are not able to identify what documents an applicant is asking for or a request is too large for us to deal with, we assist applicants to change the request so the documents can be identified and dealt with or the scope is reduced to a manageable size for us to deal with using available resources.

The FOI Act places an obligation on Resources Safety to ensure reasonably practical steps are taken to obtain the views of an individual (a third party) about release of a document if the document contains commercial, business or personal information about the individual. Third parties can claim a document is exempt from release and Resources Safety has to consider this claim when deciding whether or not to release the document.

Where access to a document is denied or an edited copy of the document released with exempt information deleted, Resources Safety provides an applicant with reasons for refusal or edited access.

An applicant has a right under the FOI Act to apply to have a decision reviewed, at no cost. A third party also has a right of review if a decision is made to release a document against their wishes. In such circumstances, the document cannot be released to the applicant until a decision is final.

If an applicant or third party is not satisfied with an internal review decision, they can make a complaint to the Information Commissioner to undertake an external review.

Applications are dealt with as soon as possible but, in any case, within 45 days of receipt as required in the FOI Act. While this is a formal and sometimes lengthy process, considering the release of documents relating to accidents through the FOI Act enables all parties to be confident that Resources Safety is meeting its legislative responsibilities and obligations when dealing with requests for access to commercial, business or personal information of individuals.

The application form is available from the forms section of the Resources Safety website.

If you have any questions relating to freedom of information, please contact Resources Safety's FOI section (ph. 08 9358 8160 or 08 9358 8156, email RSD.FOI@dmp.wa.gov.au).

AXTAT REMINDER SYSTEM ACTIVATED

An AXTAT reminder system has been implemented to further enhance the collection of mandatory reports as required for both mining and exploration under the Mines Safety and Inspection Regulations 1995. Regulation 3.42 refers to a "monthly status report form" and states, in part, "The manager of a mine must ensure that a report is provided to the district inspector in a form approved for that purpose by the State Mining Engineer as soon as is practicable after the end of each month".

As indicated in Resources Safety's guideline on accident and incident reporting, the manager must submit a monthly status report for each calendar month. This must be in the specified form and sent as soon as practicable after the end of each month (usually within two weeks).

The new system sends out reminder emails to all sites that have not submitted their status reports before the 15th of the following month. After ten working days, the system sends out a second reminder to those sites that have not responded.

If no response is received within a further ten working days, the District Inspector is advised and the mine or exploration manager contacted, and the site or company will be required to explain why the report has not been submitted. Since the system went live, there has been a marked improvement in reporting rates and raised awareness of the reporting requirements.

So, if you are responsible for submitting the monthly status report, avoid those annoying emails cluttering up your email box by sending in your forms on time every time.

REGULATORY AMENDMENTS IN FORCE

The Mines Safety and Inspection Amendment Regulations 2009 came into effect on 21 July 2009. They amend the Mines Safety and Inspection Regulations 1995, and are the result of changes identified as necessary to correct errors or clarify provisions to reflect the intended outcome of last year's amendments to the *Mines Safety and Inspection Act 1994*.

The amendments mainly relate to:

- changes to the Act in relation to forms;
- changes to health surveillance provisions to reflect current practice;
- introduction of the national licensing regime for high-risk work to the mining industry in Western Australia, including transition periods;
- removal of existing exemptions for exploration operations from requirements in respect of radiation safety; and
- corrections and updated references.

FORMS

Prescribed forms have been removed to provide more flexibility for stakeholders in the manner in which they provide information to the State Mining Engineer as required by the legislation.

In relation to health surveillance provisions, a number of changes were necessary to create consistency with other provisions and with approval of other forms designated in the regulations to obtain information.

HEALTH SURVEILLANCE

Amendments related to health surveillance were necessary to reflect current practice. When the existing regulations were first gazetted in 1996, the Perth Chest Clinic had agreed to continue storing and providing an "authorised medical officer" to read and report on chest X-rays. However, shortly afterwards, the Perth Chest Clinic withdrew its services, as it was inundated with chest X-rays from the Mine Employees' Surveillance Program, affecting its ability to manage other clinical work. As a result there is no longer an "authorised medical officer" and the Perth Chest Clinic does not provide this service. The amendments remove the reference to the Perth Chest Clinic and "authorised medical officer" for this reason.

LICENSING OF HIGH RISK WORK IN MINING

A new national standard for licensing persons performing high risk work came into effect in Western Australia from 1 October 2007 under general occupational safety and health legislation.

The amendments to the regulations ensure that the national licensing regime for high risk work applies to the mining industry. The new regime replaces the current certificate of competency with a licence. A transition period of 12 months after the commencement of the amendment regulations has been provided for surface mining, with a two-year transition period provided for underground mining operations.

Further information on high risk work licensing is available from the licensing, certificates and registration section of the Resources Safety website.

RADIATION SAFETY IN EXPLORATION

Amendments have also been made to remove existing exemptions for exploration operations from the requirements in respect of radiation safety. All mining operations will now be required to undertake an environmental radiation monitoring programme, and to prepare a radiation management plan as prescribed by the regulations.

OTHER CHANGES

Typographical errors have been corrected and references to bodies, standards, codes and guidance notes are updated.

DMP LEGISLATIVE PROGRAM AS AT 30 JULY 2009

MINES SAFETY AND INSPECTION ACT AND REGULATIONS

As discussed above, the Mines Safety and Inspection Regulations 1995 were recently amended. The latest version of the regulations is available from the State Law Publisher's website at **www.slp.wa.gov.au**

DANGEROUS GOODS SAFETY ACT AND REGULATIONS

Resources Safety has evaluated the performance of the suite of new dangerous goods safety regulations since they came into force last March, and is progressing a raft of amendments to reduce the regulatory burden and streamline administrative processes. Work has commenced on drafting the changes, which will be implemented in 2009-10. The proposed amendments cover a wide range of regulatory issues and deal with issues raised by Resources Safety staff and industry. Some of the changes are listed below.

- General Regulations — updates to the forms used to issue infringement notices.
- Major Hazard Facilities Regulations — revised definitions, changes to duties placed on operators.
- Security Risk Substances Regulations — changes to avoid licensees having to hold multiple licences for the same product, and to the requirements placed upon educational facilities.
- Goods in Ports Regulations — additional powers for dangerous goods officers in relation to reportable situations, new requirements in relation to special berths.
- Road and Rail Transport Regulations — raft of amendments to bring regulations in line with the new national model legislation.
- Storage and Handling of Non-explosives Regulations —

revised definitions (including that for dangerous goods), changes to the application of regulations to avoid difficulties relating to the inclusion of unintended sites in the regulatory scope, modified requirements placed upon licensees.

- Explosives Regulations — revised definitions, amendments to create an exemption for police officers from having to obtain a security clearance, a variety of changes to the requirements placed upon licensees (including modified requirements for outdoor fireworks events and blast plans), changes in the fines system.

PETROLEUM LEGISLATION

Drafting of the safety regulations attached to the *Petroleum Pipelines Act 1969* (PPA) and *Petroleum and Geothermal Energy Resources Act 1967* (PAGERA) is nearing completion. A period of public consultation will soon follow to allow stakeholder and industry input into the regulations.

Once the regulations are completed, the remaining parts of the *Petroleum Legislation Amendment and Repeal Act 2005* (PLARA), which introduce an occupational safety and health regime into the PPA and the PAGERA, will be proclaimed along with the safety regulations.

NATIONAL ACTIVITY

In a historic decision, the National Mine Safety Framework (NMSF) was endorsed by the Council of Australian Governments (COAG) on 30 April 2009, with the decision available at **www.coag.gov.au/coag_meeting_outcomes/2009-04-30/index.cfm**

The Ministerial Council on Mineral and Petroleum Resources (MCMPR) met on 9 July 2009 and agreed that the Commonwealth, State and Territory governments would commit $1.7million in the first year to implement the NMSF. The tripartite NMSF Steering Group is responsible for implementing the seven strategies. The MCMPR communiqué is available at **www.ret.gov.au/resources/mcmpr/Pages/mcmpr.aspx**

The Workplace Relations Ministers' Council (WRMC) met on 18 May 2009 and agreed to a framework for uniform occupational heath and safety (OHS) laws across jurisdictions. A detailed communiqué outlining the WRMC's response to the recommendations of the National Review into Model OHS Laws is available at **www.workplace.gov.au/workplace/Publications/PolicyReviews/WorkplaceRelationsMinistersCouncil.htm**

The WRMC also met on 11 June 2009, whereby an intention to transfer OHS coverage of Comcare self-insured licensees to State and Territory jurisdictions was proposed.

The Safe Work Australia Council held its inaugural meeting in Sydney on 10 June 2009. The meeting focussed on the development of model occupational heath and safety legislation as agreed by WRMC. The communiqué is available at **www.safeworkaustralia.gov.au**

Resources Safety's involvement

Under the auspices of the Council of Australian Government's Business Regulation and Competition Working Group, Resources Safety continues to provide input through the WA Department of Treasury and Finance to the priority areas of national reform including occupational safety and health, trade licensing, and oil and gas and upstream petroleum production.

MIAC RECONSTITUTED

The Mining Industry Advisory Committee (MIAC) was established in April 2005 under section 14A of the *Occupational Safety and Health Act 1984* (OSH Act) as a statutory advisory body advising on matters relating to occupational safety and health in the mining industry. The original members' three-year terms expired in 2008. After an unforeseen delay, the new membership has been finalised.

The tripartite membership of MIAC is determined jointly by the Minister or Ministers responsible for the administration of the OSH Act and *Mines Safety and Inspection Act 1994*. The chairperson of MIAC is determined under section 14A of the OSH Act and is a member of the Commission for Occupational Safety and Health.

The new Chairperson is Mr Malcolm Russell, Executive Director, Resources Safety Division of the Department of Mines and Petroleum.

The newly appointed membership comprised:

- *Mr Martin Knee*, State Mining Engineer, Resources Safety
- *Ms Nicole Roocke*, The Chamber of Minerals and Energy Western Australia
- *Mr Darren Batchler*, The Chamber of Minerals and Energy Western Australia
- *Mr Gary Wood*, UnionsWA
- *Mr Stephen Price*, UnionsWA
- *Dr Peter Lilly*, expert member.

The first three meetings for 2009 were held on 29 and 30 June and 10 September. Future meetings are scheduled for every second Thursday of every second month.

Plans for 2009-10 include:

- submission of members' comments, to the Minister for Mines and Petroleum, on the recommendations arising from the statutory review of the *Mines Safety and Inspection Act 1994* conducted by Commissioner S J Kenner; and
- formulation of a strategic plan for MIAC.

DANGEROUS GOODS SECURITY CARDS

Resources Safety is now in the process of sending out dangerous goods security cards for processed applications. It is expected that this process will take several months. The current exemption from requiring a card expires at the end of the year, by which stage all individuals required to have a security card under the dangerous goods safety legislation must have one.

LEGAL PROFESSIONAL PRIVILEGE

WHAT IS LEGAL PROFESSIONAL PRIVILEGE?

Legal professional privilege is a privilege claimed by a client to withhold information or documents that would reveal confidential communications between lawyer and client made for the dominant purpose of:

- giving or obtaining legal advice; or
- providing legal services, including representation in legal proceedings that have actually commenced or are anticipated by the person claiming legal professional privilege.

The privilege applies to communications as well as documents. It will protect access to oral communications, written records of communications and records of communications in some mechanical or other form.

The communication must be confidential and made in a confidential manner. If the communication was made orally in public, and within the hearing of other people, for example, it would not generally be confidential. There may be situations where the client had no control over the presence of other people where the communication will still be privileged.

Privilege extends to communications with a third party for the benefit of a client, provided the dominant purpose is legal advice or legal services. For example, an opinion from an engineering consultant or a witness statement obtained for the predominant purpose of actual or anticipated legal proceedings would be privileged.

It also protects the disclosure of documents that record legal work carried out by the lawyer for the benefit of a client, such as notes or research memoranda.

Documents such as contracts, accounting records, internal reports and memoranda that were not created predominantly for the purpose of legal advice or litigation will not be covered by legal privilege, even if they have been lodged with the lawyer for the purpose of obtaining legal advice.

WHAT IS THE TEST FOR LEGAL PROFESSIONAL PRIVILEGE?

The test for whether a communication is privileged focuses on the purpose for which the communication was made, not the information in the communication.

A document or other form of confidential communication will be protected by legal professional privilege if it has been created for the dominant purpose of obtaining legal advice or preparing for, or conducting, court proceedings. This is called the “dominant purpose test”.

If the communication was created for more than one purpose, then the person claiming legal privilege must establish that the dominant purpose was to seek or give legal advice or to conduct litigation. For example, a report produced for the purpose of obtaining legal advice may also provide an evaluation of a particular procedure. The report would still be privileged. If, however, it was created primarily to evaluate particular operating procedures of the organisation, it would not be privileged.

APPLICATION OF LEGAL PROFESSIONAL PRIVILEGE TO AN INVESTIGATION

For inspectors of mines, section 29 of the *Mines Safety and Inspection Act 1994* is relevant for dealing with a claim of privilege by a mine manager or employer. If the claim is made without reasonable grounds, the claimant risks prosecution for

obstructing an inspector carrying out a lawful investigation. Obstruction includes failing to provide information as requested by an inspector.

PRIVILEGED DOCUMENTS

Only confidential communications between a lawyer and client, brought into existence for the dominant purpose of obtaining legal advice, or for use in actual or contemplated legal proceedings, are privileged.

Documents such as contracts, employee records, maintenance records and work systems will not be privileged, even if they have been given to the company lawyer for the purpose of providing legal advice or for litigation.

Communications with the company lawyer seeking advice about the legal position of the company may have been made immediately after the accident or occurrence. These communications will be privileged, but are unlikely to be relevant to the conduct of the investigation.

Documents produced by the company following its own investigation will only be privileged if they are confidential communications between the company and its lawyer for the purpose of obtaining legal advice, or for litigation. For example, an investigation carried out by a safety and health representative would not be privileged.

All other corporate documents should be available to be produced upon request.

CLAIM OF LEGAL PRIVILEGE IN A DOCUMENT

A claim of privilege to resist the production of documents should be made clearly and precisely. An assertion that a document is protected by privilege will not, on its own, be enough.

The claim must be made and justified for individual documents. A blanket claim for a group or bundle of documents is not valid.

The person claiming legal professional privilege has the onus of proving that the claim is valid. They must provide sufficient information to enable the inspector to determine whether the particular document will be privileged. The following information is required to make an informed decision:

- a clear description of the communication, including the date on which it was made (e.g. fax from…to…regarding… dated…); and
- justification of the claim for privilege. Each document must satisfy all the elements of privilege to justify the claim for non-disclosure:
  - there must be a lawyer–client relationship
  - the privilege must be claimed for a confidential communication between a client and lawyer, or with a third party for the benefit of the client
  - the communication must have been made for the dominant purpose of obtaining or giving legal advice, or for providing legal services in respect of actual or anticipated legal proceedings.

Where a communication has been brought into existence for more than one purpose, the person claiming the privilege must establish that the dominant purpose is for legal advice or litigation.

The person claiming privilege does not have to give information that would reveal the content of the document, but should provide sufficient evidence to demonstrate objectively that the claim is valid.

MR RADIATION

IVAN FETWADJIEFF

It has been a busy few years for Resources Safety's Senior Scientific Officer Ivan Fetwadjieff, known as "Mr Radiation" around the office. As the price of uranium has risen, so has Ivan's workload.

"In the last two years, I've had 40 radiation management plans to consider," Ivan said. "Before that, there wasn't anywhere near that amount.

"The spike in submissions and the interest in radiation protection actually came before the ban on uranium mining was lifted (in November 2008).

"It was the increase in the price of uranium that led to an increase in uranium exploration. Interestingly, the demand actually dropped off after the ban was lifted, but it's started to increase again."

Ivan said he expected demand to stay strong, especially if the number of uranium applications for Western Australia's Co-funded Industry Drilling Program was any indication.

The program, which gives explorers up to $150,000 towards their exploration costs, received about 30 applications from uranium explorers, making it the third most sought after mineral.

As well as assessing radiation management plans, Ivan is also involved with the review of the naturally occurring radioactive materials (NORM) guidelines published by Resources Safety, and is part of a Commonwealth working group for the establishment of a national radiation dose register.

He is also kept busy consulting with companies, liaising with the Radiological Council, and speaking on radiation safety and regulation at various industry and government forums.

Although radiation has long been a part of Ivan's working life, his scientific career started with an apparently safer field – vascular plants.

After graduating from the Western Australian Institute of Technology with a Bachelor of Applied Science in Biology, Ivan worked for the Department of Agriculture at the Western Australian Herbarium, conducting a census on the State's vascular plants.

However, before joining the Department of Agriculture, Ivan had toyed with the idea of teaching, but six months into a Diploma of Education it was suggested he try something else.

"I did alright with the theory, but I wasn't that mature then," he said. "I felt like a kid in the class. I couldn't control the kids because I was one of them.

"It's ironic, because one of my peers at the Institute, a very laidback surfer dude, who I would never have thought would become a teacher, went on to be just that. In fact, he teaches my son now."

Ivan also stays in close touch with several other peers from his college days because they work with him at Resources Safety.

"It's a very small world. Even our new Director General did my course, albeit ten years later," Ivan said.

After finishing at the WA Herbarium when he was in his early twenties, Ivan soon began his career in radiation protection, a career that has lasted more than two decades.

"I didn't have a job and I had some friends who lived next door to a man who was the director of an industrial radiography company, a non-destructive testing company — their sons and I got jobs there," he said.

"That's where I got into radiation protection. They were using radioactive sources to basically X-ray welds and pipes for North West Shelf gas projects like Rankin."

It was a role well suited to a young man with no commitments and a cool head because of the long, unsociable hours the role demanded, as well as the potentially lethal radioactive sources he had to handle.

"Because you're exposing radioactive sources in factory situations, you have to do it after-hours when all the workers have gone home so you can barricade off areas," he said.

"Sometimes you'd be up all night doing radiography. And it's not like when we talk about uranium mining or mineral sands. These are huge dose rates — the sort of sources that kill people."

After wielding radioactive sources, Ivan joined Radiation Health in the Department of Health, where he was promoted to scientific officer for industrial radiation.

"Many people aren't aware of the huge amount of radiation sources used by industry," he said. "For example, a lot of food processors have X-ray machines, like the makers of potato chips; they have X-ray machines to check for the black bits. Some food processors use radiation to measure the amount of fat in hamburgers."

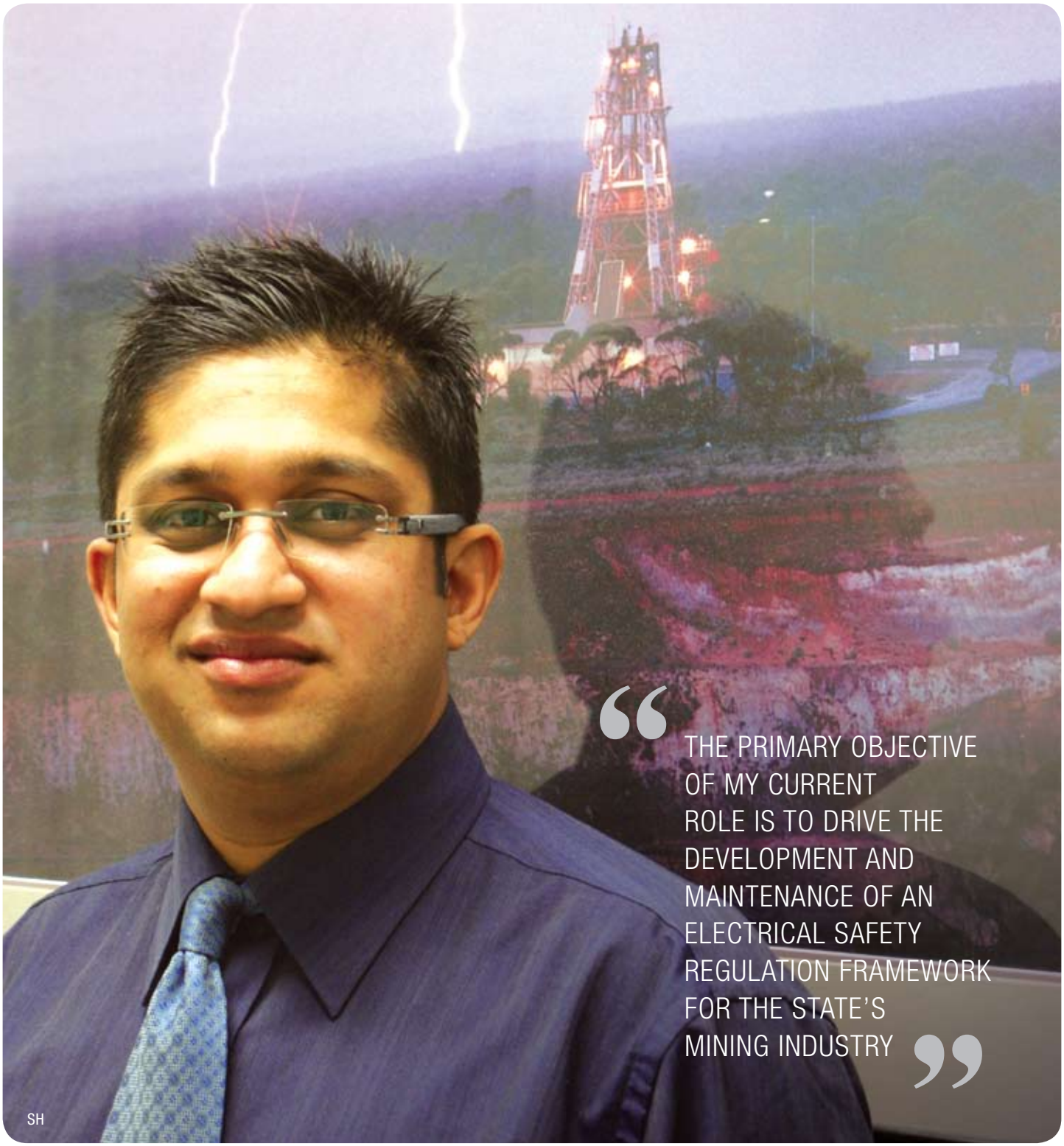
Ivan's role was to make sure the equipment was used correctly and safely, and the companies had radiation management plans.

It was also an interesting experience because he was exposed to a variety of industry processes, from Australia Post and Perth Airport to breweries and food manufacturers.

In the late 1990s, he joined Resources Safety and adjusted his focus from sealed sources of radiation to open sources. After many years with the division, he has increased his skill set substantially and become an industry figure on radiation issues. It has been a career without a hitch to date.

"People would be surprised about the amount of radioactive mining that has occurred in Western Australia in the past 40 years," he said.

"The experience we have in regulating radioactive and hazardous activities such as mineral sands and gold mining means we are on very familiar ground when it comes to regulating the State's up-and-coming uranium industry."



ELECTRICAL ENGINEER MEANS BUSINESS

SAJ KHAN

Electrical Engineer Saj Abdoolakhan is following a passion for safety and engineering that has taken him from one side of the Indian Ocean to the other. Saj, originally from Mauritius, is Resources Safety's Electrical Engineering Manager and leads the division's electrical safety section of the mines inspectorate.

"The primary objective of my current role is to drive the development and maintenance of an electrical safety regulation framework for the State's mining industry," he said.

"One of my main duties is to manage and direct the operations and resources of the Electrical Inspection section and provide engineering support to the regional electrical inspectors. I have to ensure that the efficiency and effectiveness of the team's performance remains aligned with Resources Safety's targets, policies and procedures.

"I am also involved in the ongoing development and reviews of strategies and campaigns aimed at improving the overall level of safety in the WA mining industry. As a result, I have to make sure that I am always up-to-date with safety issues facing the industry and the technology that can be used to address these issues."

Saj, who gained a Bachelor of Science in Electrical Engineering from the University of Cape Town in South Africa, started his electrical engineering career in Mauritius at an ammonium-nitrate-based fertiliser manufacturer.

It was the inherent extreme hazards in this role that inspired his interest in safety, as well as heavy machinery and engineering.

"Clearly, the very first thing that I learned was safety," he said. "This is what has influenced my whole career."

"It was a very challenging job, especially for a graduate engineer, and I soon developed my passion for heavy engineering and machinery.

"One of the reasons I moved from Mauritius to Australia was because it presented an opportunity to get into mining. And mining meant heavy machinery and heavy engineering, so this influenced my decision to move."

The first move was to Mt Isa in Queensland's far north – a very different setting to the island paradise of Mauritius (to say the least).

It was a decision that would guarantee him a well-rounded education in the mining industry. However, it was one that started with quite a shock.

"The Australia that my wife and I imagined, from TV and documentaries, was very different to the one we found in Mt Isa," he said.

"Having said that, it was a very good move, career-wise for me, because in Mt Isa you have everything you want to know about mining. There are open operations, deep underground mines, shaft winders and advanced processing plants. So you get exposed to the whole mining world in a single town."

After completing many major projects at Mt Isa Mines and leading the team of in-house electrical engineers, Saj began to look for something on a broader scale.

"As an engineer, I have been involved in major projects from conception, through design to commissioning. I have had exposure to project and maintenance management and been involved in writing up policies and procedures," he said.

"So when I saw my current job advertised, I also saw the opportunity to take my interest in safety to a much higher level. As an engineer at a mine you can influence safety only at that particular mine site, but being in charge of the electrical inspectorate in Resources Safety gives me an opportunity to have an impact on the whole mining industry in WA, which is one of the biggest in the world.

"Furthermore, as a member of the Standards Australia committee for electrical equipment on mines and quarries, I can get involved with electrical safety at a much higher level."

Saj said that the priority for the electrical engineering section, and Resources Safety as a whole, was to keep moving towards a proactive approach. The skills shortage and an inability to recruit inspectors have meant that the last two years had been mainly reactive, but with a full complement of staff, the future looks much different.

"We see both ends of the safety spectrum every day in our job," he said.

"At one end, there are those mines that always strive to do the right things and work with the inspectors to do better, and then there are those at the other end who need pushing just to achieve the absolute minimum."

Saj started his career never contemplating moving into the public service, even though his parents were both career senior public servants.

"I ended up a public servant, and I never thought I would," he said.

"I've been pleasantly surprised and not disappointed about what I've seen so far. In the public service, we do mean business."

> “THE WORKFORCE AND SUPERVISORS NEED TO REPORT THE BAD NEWS UPSTAIRS SO THAT ISSUES CAN BE RECOGNISED AND ADDRESSED BY MANAGEMENT”

Photo courtesy Paul Reynolds, Alcoa Pinjarra. Mines Inspector Adrian Lang with staff at Alcoa Pinjarra Alumina Refinery.
Left to right: Tony Lucas, Marcy Gosby, Patrick Brown, Adrian, John Burden, Peter Rozentals, Olivia Cullen, Michael Hersov

SEEING TO SOUTH WEST SAFETY

ADRIAN LANG

When it comes to experience on mine sites, you can't go past Resources Safety's Adrian Lang. With more than 35 years of experience under his belt, the District Inspector of Mines in the South West region has been working in Australia's mining industry since 1971.

Adrian's experience with the then-Department of Mines started in 1991 when he was employed as a geotechnical engineer. In that role, Adrian was involved in visiting mine sites throughout Western Australia, focusing on soil and rock stability issues.

"At the time, some shallow open pit gold mines were experiencing problems with planes of weakness (geological structure) and low-strength weathered rock masses contributing to rock falls," he said. "We were looking at these issues to prevent incidents such as rock falls, and encouraging industry to modify its open pit designs."

Three years after starting with the department, Adrian was asked by well-known mining industry figure, Jim Torlach, to draft geotechnical regulations for underground and open pit mines.

"I wrote the first draft in 1994 and this was circulated to industry for comment. Then, in 1995, the new *Mines Safety and Inspection Act* and associated regulations came into force, which I believe, contributed to a much safer resources industry in Western Australia," he said.

"In particular, the new Act and regulations helped underground mining operations, with companies starting to use a more comprehensive approach to their ground control systems."

In addition to Adrian's many years of onsite work experience, he has also published papers and studied in the resources safety area.

In 1999, Adrian followed up his regulatory work by publishing a paper on geotechnical mining regulations in Western Australia.

He also completed a paper that looked at rock falls on Western Australian mine sites. The paper discussed the decrease in fatalities on mines and highlighted the work by mines to improve their ground control standards.

In 2003, Adrian undertook a course, involving risk management, through The University of Queensland's Minerals Industry and Health Centre.

"I chose the course because it was a widely discussed topic and I wanted to learn more about risk management in the minerals industry," he said.

"The course led to me eventually completing a Master's course in minerals industry risk management. For my thesis I conducted research on fatigue risk management of underground employees at five mine sites."

While studying risk management, Adrian was also presented with an acting opportunity to head up the Resources Safety Health Management Branch.

"In 2005, I felt I had achieved a lot in my geotechnical role so, when the opportunity arose to carry out some work in the health area, I thought this sounds like an interesting challenge," he said. "The role also complemented the study I was undertaking in risk management at the time, and although working full-time and studying kept me very busy, both roles provided me with an informative and interesting insight into health issues on mine sites."

In the Health Management Branch until the end of 2006, Adrian then headed to Kalgoorlie, taking up a position as a District Inspector of Mines.

"I went to Kalgoorlie as I knew a lot about underground mines, and had been working with people in the area for the last ten to 12 years," he said. "I also wanted to get more involved in the broader activities that were carried out by District Inspectors."

In February this year, with an interest in the outdoors, Adrian moved to the South West region and took up a position as District Inspector of Mines based in Resources Safety's Collie Office.

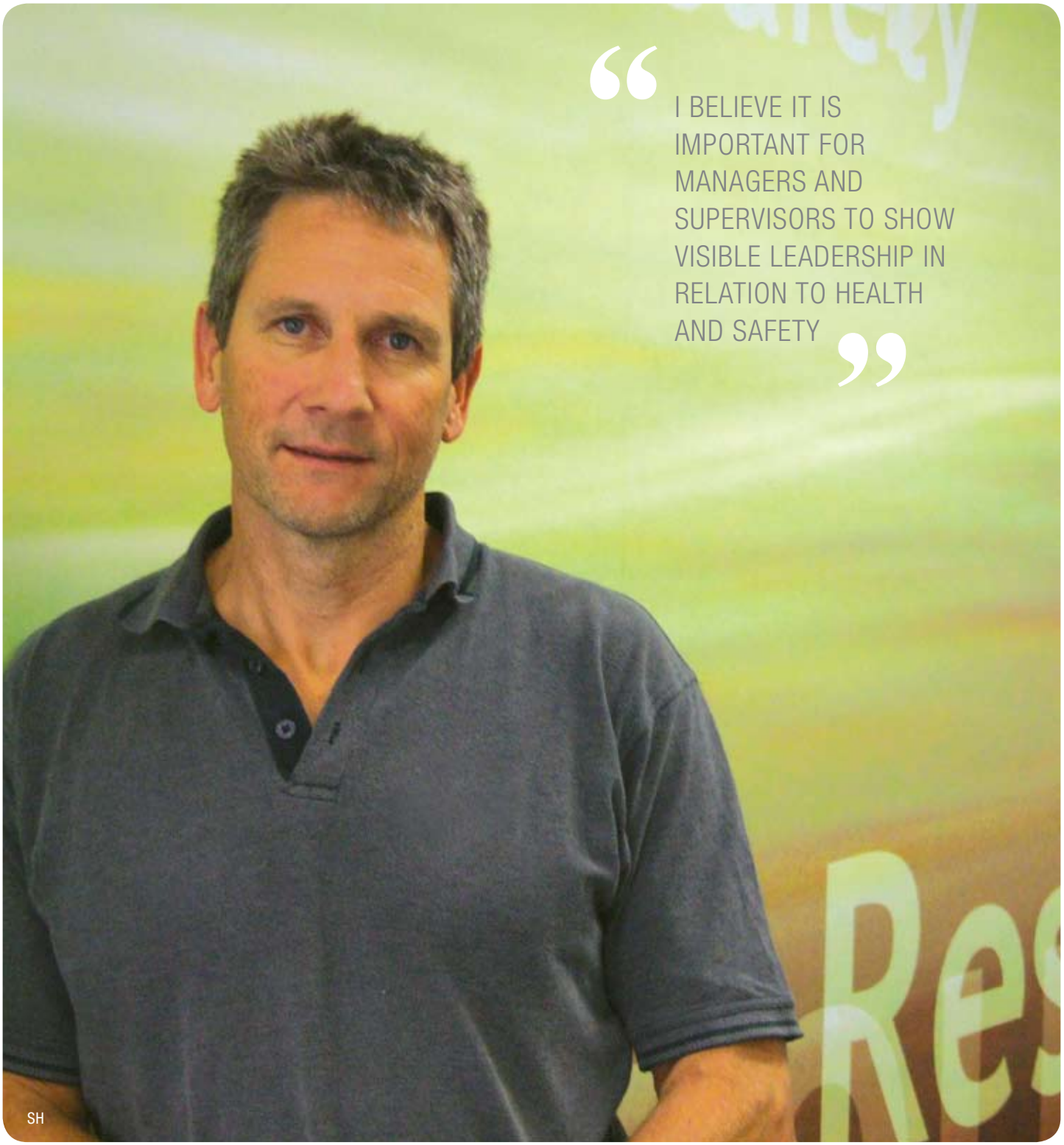
Adrian said that, in the role, he has identified the potential difficulties in communication as a current issue facing industry.

"Communication appears to be deceptively simple — we do it all the time, yet it is unique in that it can fail in two directions, between an employee and their supervisor and vice versa," he said. "Communication is not a simple one way process — both people must be actively involved to enable the right message to be received and understood.

"Employees also need to be trained in hazard identification so they can understand and identify hazards in their workforce and then communicate them effectively, where necessary, to their supervisor.

"The workforce and supervisors need to report the bad news upstairs so that issues can be recognised and addressed by management. If supervisors and management are only hearing good news, this makes me suspect that there could be problems with safety systems at a mine as management and supervisors also need to encourage the reporting of bad news, and this is not easy as some people only want to hear the good news.

"Our safety systems can only be as good as the communications flowing through an organisation."



MINE PLANNING BACKGROUND HELPS

ANDREW HARRIS

From a mine site in Zambia to mine sites all over Australia, Resources Safety's new District Inspector of Mines Andrew Harris brings a diverse wealth of experience to his new role.

Andrew, who previously worked for Resources Safety in 2003, started with the Department of Mines and Petroleum in March and is responsible for overseeing several mines located near Leinster.

Andrew said the variety of work and the opportunity to build relationships were just some of the job's highlights.

"One of the attractions of the role is being exposed to a variety of mining operations and practices ranging from very large to very small operations," he said. "It enables you to see what is being done well and acts as a source of information to other mines on best practice. "The role requires a high level of relationship building and contact with site personnel at all levels of the organisation." Andrew said the biggest challenge he faced was dealing with issues in a timely fashion.

"Leinster is about 900 kilometres from Perth, so travelling to mine sites to deal with issues can be a challenge," he said. "Also, getting to know mines and their associated conditions and issues can take some time.

"Mining induced seismicity is a key issue currently facing underground mining. It is caused by modification of stress in the rock mass due to mining activities, typically at depth. Rock bursts are seismic events in which rocks are suddenly ejected from the wall of the mining void as a result of increased stress in the surrounding rocks. These bursts can pose a risk to people working in the area.

"Several mines in my inspection area are experiencing mining induced seismicity, with some mines better prepared and resourced to deal with the issue than others. The key challenge is assisting mines to get on the front foot and implement proactive plans to control the issue before it becomes a problem and poses a risk to safety or personnel.

"A couple of mines are using automated bogging systems underground, and this trend of automation appears likely to continue in the future. The system offers substantial benefits in removing operators from hazardous zones, increasing productivity and maximising utilisation of equipment.

"However, risks associated with the new system, because the operator is removed from the working area, need to be thoroughly assessed to ensure other hazards are identified and managed."

A part of the mining industry for more than 25 years, Andrew has filled a number of diverse roles, undertaking work across Australia on mine sites in New South Wales, Queensland, Tasmania and Western Australia, as well as overseas in Zambia. He said the two years work he undertook in Zambia in the early 1990s were one of his career highlights.

"Zambia was an adventure and an eye opener in relation to both work and lifestyle," he said. "I worked as a planning engineer at Konkola underground copper mine, located 10 kilometres from the border of Zaire. I was responsible for a team of Zambian national technicians and officers, and my key role was training and mentoring team members.

"Mining methods and practices were labour intensive and quite primitive by Australian standards back then. There were no computers, wheelbarrows were used for mucking dirt, and hoses were used to syringe grout for roof bolts.

"Mining operations were severely constrained by the lack of foreign currency in a third-world setting, and, unfortunately, this translated into poor working conditions and safety standards.

"Konkola was arguably one of the wettest mines in the world so major infrastructure was required to dewater the mine and control water inflows.

Working in engineering-based roles until 2003, Andrew then decided to change direction, becoming a District Inspector for Resources Safety based in Kalgoorlie.

"The role in Kalgoorlie was essentially the same as my current position, just a different set of mines," he said. "Certainly my previous experience at Resources Safety has enabled me to settle in relatively quickly as I have already used some of the tools and been exposed to many specific duties and tasks. There is, however, still a lot to absorb."

Andrew said that after two years as a District Inspector, he moved to Perth with his family and worked in a corporate occupational health and safety role with a mining company until the end of December 2008.

He said the primary purpose of Resources Safety was to improve the safety and health of those working in, or affected by, Western Australia's resources industry.

"Fundamentally, this is about stopping work-related accidents and illnesses occurring, and I support a proactive approach by Resources Safety to achieve this, working with both industry and employees," he said.

"I believe it is important for managers and supervisors to show visible leadership in relation to health and safety. This includes regular field inspections and audits, engaging with the workforce on safety matters, and not accepting unsafe practices and conditions.

"I think the mining industry can do better in consulting with safety and health representatives and the workforce in both formal and informal ways in order to utilise the experience and knowledge of the workforce.

"Individuals, however, also need to take responsibility for safety of themselves and others. This means working according to established procedures, using personal protective equipment, fixing and reporting hazards, reporting incidents, and assessing risks before starting work.

"With my strong mine planning background, I am also a firm believer that achieving safe systems in the mining sector starts at the design stage as this is where risks due to major hazards can be eliminated and substantially minimised."

JANAYA CELEBRATES SCHOLARSHIP WITH A WHISPER

Analysis of Resources Safety's AXTAT database reveals that sprains and strains are consistently the most prevalent injury sustained by mining workers.

We know from the findings of the *Manual Task Project Scoping Study* that a significant proportion of sprains and strains are a result of workers performing manual tasks. But what are the other causes of sprains and strains? It also brings into question what injuries, apart from sprains and strains, are prevalent in Western Australian mining workplaces?

Janaya Patterson, a student at Curtin University of Technology in her third year of a Health, Safety and Environment Degree course, recently spent time at Resources Safety working on a project to provide us with answers to these and other questions.

Janaya is the second recipient of a scholarship from the Jim Torlach Commemorative Fund, set up in honour of the late State Mining Engineer, and receives practical employment opportunities in the mining industry as well as full payment for her HECS fees for three years.

The 2008 Jim Torlach Scholarship holder says she has always had a passion for helping people and making their jobs safer. Janaya said the scholarship, set-up in memory of James Milne Torlach, who made an outstanding contribution to the improvement of resources safety and health in Western Australia, offers recipients the tools needed to develop a better understanding of safety issues.

"This scholarship offers access to people you would not usually meet at university, and so I believe it gives scholarship holders an edge over other students doing the same degree," she said.

"Through the scholarship, you get to meet some very influential people in the occupational health and safety business, who have been in the industry for years and know the ins and outs of what goes on in the industry."

Janaya said she was very excited to hear of her success, but described it as a funny moment as she was in the university library at the time.

"After a nerve-racking panel interview, the board explained that if I was successful they would give me a call," she said. "About three to four days later I was sitting in the library at uni when my mobile rang — it was Resources Safety's State Mining Engineer Martin Knee. After Martin delivered the news, I was very excited but trying to express it in a whisper. I couldn't pack my things up quickly enough so I could get out of the library and tell my friends."

As part of the scholarship, Janaya completed four weeks' work experience with Resources Safety. She said it was an invaluable experience as she gained knowledge and contacts that would help her career.

"My time with Resources Safety was fantastic as I had access to some very influential people in the resources industry who hold a wealth of knowledge," she said. "These people were not only happy to answer all my questions but also offered me guidance.

"My main tasks during my time at Resources Safety involved analysing data taken from the Division's AXTAT database. Although the data showed that a significant proportion of strains and sprains resulted from workers performing manual tasks, we wanted to find out more about how the injuries were caused."

Janaya, whose family have been in the mining industry for years, has been working as a laboratory analyst in the resources sector for the past ten years. The 34-year-old Curtin student, who also has six years' experience in mines rescue, said she just wants to help improve safety in mining.

"I just want people in the mining industry to take a step back, have a look at the tasks they perform everyday and ask themselves — is there a potential for me to be harmed in any way?" she said. "If so, would you keep performing that task the same way if you knew that you may not go home in one piece?

"Although I have not always wanted to work in the safety sector, my passion for helping people and getting them to think twice about doing a job has always been there.

"The industry has grown since I started working in it which is exciting to see, but I still think there is room to grow and to better ourselves when it comes to health, safety and environmental issues."

THE JIM TORLACH SCHOLARSHIP

James (Jim) Milne Torlach (1938-2006) made an outstanding contribution to the improvement of safety and health in the mining industry in Western Australia, being responsible for the complete overhaul and modernisation of mine safety legislation, culminating in the passage of the *Mines Safety and Inspection Act 1994*.

This perpetual scholarship honours his memory and is awarded annually to an outstanding first year occupational health and safety student through the School of Public Health at Curtin University of Technology.

The scholarship provides:

- payment of all HECS fees for the three years of study in the Bachelor of Science (Health, Safety and Environment); and
- practical experience working in occupational safety and health in the mining industry.

For eligibility criteria and further information, contact the course coordinator:

Telephone: 08 9266 7819
Fax: 08 9266 2958
Email: futurestudents@health.curtin.edu.au

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WHAT IS YOUR HEARING TEST TELLING YOU?

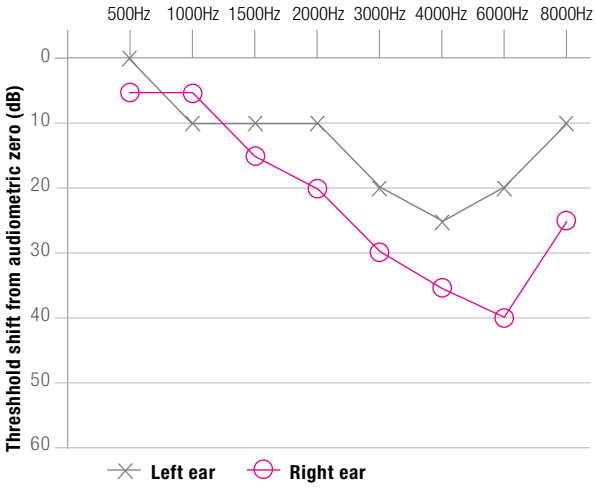
Hearing tests are required for all mining employees who may be exposed to significant noise at work. They are required within one to three months of starting work and must be followed up regularly. Resources Safety and WorkCover receive a copy of the initial test and subsequent tests done every five years thereafter for employees who remain working in the Western Australian resources industry. The hearing test is one part of the MineHealth health assessment.

The purpose of the first hearing test is to determine your hearing ability before you start your new job. Subsequent tests measure changes from your baseline test. If significant changes are measured, employers and their employees need to review noise levels at work to ensure that exposure to loud noise is minimised. It is important to remember that excessive noise exposure outside of work also damages hearing, so employees may also need to review their lifestyle.

The hearing test involves sitting in a quiet booth, listening for the quietest sounds you can hear through earphones. The audiologist (or audiometric officer) sits outside the booth, gradually increasing the volume of different sound frequencies. You will recognise the different frequencies as different tones. When you first hear the sound, you press a button that sends a message to the audiologist who records the results on a graph. The tester should give you at least two tries for each frequency, at both ears. The average for each frequency at both ears is then plotted on a graph or audiogram.

The zero on the audiogram represents the average hearing threshold for young adults with disease-free ears. This is also called “audiometric zero”. Hearing test measurements are compared with this volume and are measured in decibels (dB).

SAMPLE AUDIOGRAM



As with all human characteristics, what is normal for one person may not be normal for another person, and minor deviations between individuals are common. It is not unusual to have more sensitive hearing than audiometric zero.

“Threshold shifts” are hearing level changes as compared with audiometric zero or, if you have had multiple tests, previous results. Given the normal variations between people in any population and limitations of the testing method, threshold shifts of less than 5 dB are not considered significant.

So what threshold shift is caused by normal aging? When should we be thinking about turning down the radio and checking that our hearing protection equipment is working efficiently?

There is much discussion among hearing experts about the amount of hearing loss that can be attributed to normal physiological aging of ears, exclusive of noise exposure. Regardless of what

can be attributed to the aging process, it is well recognised that those exposed to excessive noise levels at work usually have worse hearing than those with limited or no exposure.

Unfortunately, if you are less able to hear normal conversation when you are younger, you will probably turn up radio and television volumes, and ask people to speak up — and this will further impact negatively on your hearing.

Hearing damage that occurs in young employees is irreparable and will increase throughout the employee's life if effective protective mechanisms are not provided at work nor encouraged out of work. Therefore, mining employers are encouraged to concentrate on upgrading hearing conservation programs as a priority. Resources Safety recommends that everyone who works in a noisy workplace should not only have regular hearing tests, but also look at the test results and find out what they mean. If significant changes are occurring, then it is imperative to review all noise exposures at work and home.

When should we be alarmed and what can we do?

Resources Safety recommends that, following completion of your hearing test, you discuss the results with the audiologist or audiometric officer so you understand what they mean for you. You could ask if your hearing level is normal for your age.

Resources Safety also recommends that employers review their employees' hearing tests to identify who may have a significant threshold shift and investigate the causes. Employees who can hear conversations will understand what job they need to do and how to do that job. They can also hear warnings. Employees whose hearing has been impaired could have difficulties.

Good-practice hearing conservation strategies should be implemented promptly when a hearing test indicates that a significant threshold shift is recorded for an employee. In order to minimise further hearing impairment, the employer should:

- review the worker's exposure to noise and chemical agents that affect hearing (known as ototoxins);
- redetermine exposure to noise and ototoxins;
- reduce exposures to noise and ototoxins;
- evaluate hearing protector acceptability, use, fit, maintenance and compliance; and
- if a permanent threshold shift or hearing impairment is detected, provide professional counselling and expert advice on methods to assist hearing in social and business environments if necessary. A hearing aid may be required.

What is a significant hearing threshold shift?

In Western Australia, a binaural (both ears) hearing loss of 10 per cent or more, compared with the WorkCover registered baseline hearing test, is considered to be a hearing disability, and compensation is applicable. This level of hearing loss equates to around 30 to 40 dB difference in both ears. For normal communication, people with this type of hearing loss require quiet backgrounds and hearing aids.

Preventing this level of hearing loss requires more attention by everyone. Both employees and employers need to consider the role of workplace and personal noise and ototoxin exposures as the damage doesn't stop when you leave work.

The United States Occupational Safety and Health Administration (OSHA) describes a method for calculating changes between baseline and subsequent hearing tests. Resources Safety has reviewed a number of techniques and found it to be the easiest to apply. It is already being used by some mining companies.

Step 1: Calculate the arithmetic average shift at 2000, 3000 and 4000 Hz for both ears.

Step 2: A shift of more than 25 dB in either ear (compared with audiometric zero) is considered to be significant.

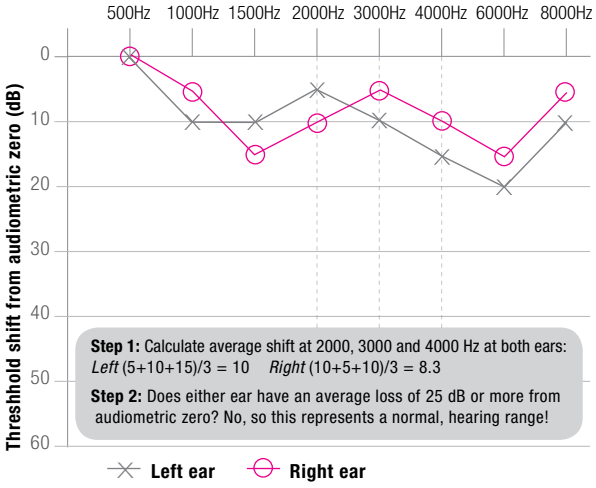
You should review your lifestyle choices. This may involve reducing alcohol consumption, fixing mufflers on the Harley Davidson and turning down the volume on your iPod.

Step 3: If you have had a follow-up hearing test, compare your average hearing loss of this test with your baseline test.

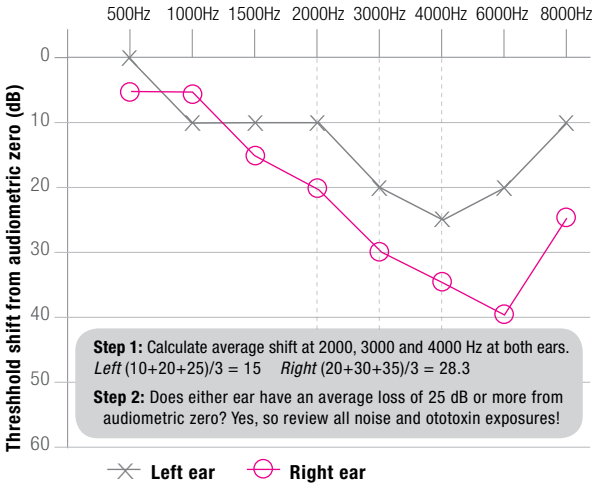
Step 4: An increase in the average shift of 10 dB or more, in either ear, between these tests is considered to be a significant change.

This should trigger a review of all of your noise and ototoxin exposures at home and work.

EXAMPLE OF BASELINE HEARING TEST



EXAMPLE OF FOLLOW-UP HEARING TEST



In the examples shown, a comparison of the follow-up test with the baseline test tells us the following.

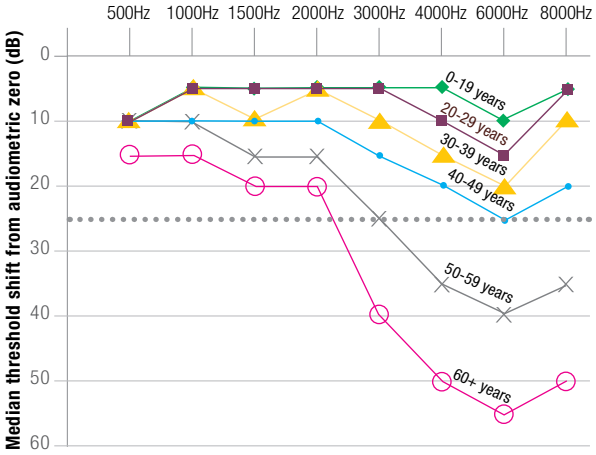
At the left ear: The baseline test shows an average loss of 10 dB, and at the follow-up test it is 15 dB. The average change is 5 dB. This is not significant.

At the right ear: The baseline test shows an average loss of 8.3 dB, and at the follow-up test it is 28.3 dB. The average change is 20 dB. As this is over 10 dB, it is a significant change requiring an immediate review of all noise and ototoxin exposures and hearing conservation strategies.

What's happening in the Western Australian mining industry?

A recent review of all of the hearing tests submitted as part of the MineHealth health assessments from 1996 until 2008 suggests that many employees entering the Western Australian mining industry already have significant threshold shifts. This is profound if you are over 50 years of age. The figures further suggest that employees need to give more consideration to their personal noise exposure, including outside of the workplace.

MEDIAN THRESHOLD SHIFTS AT INITIAL ASSESSMENT FOR WA MINING INDUSTRY 1996-2008



ALL ABOUT THE FREQUENCIES

High-pitched sounds have high frequencies while deeper sounds have lower frequencies.

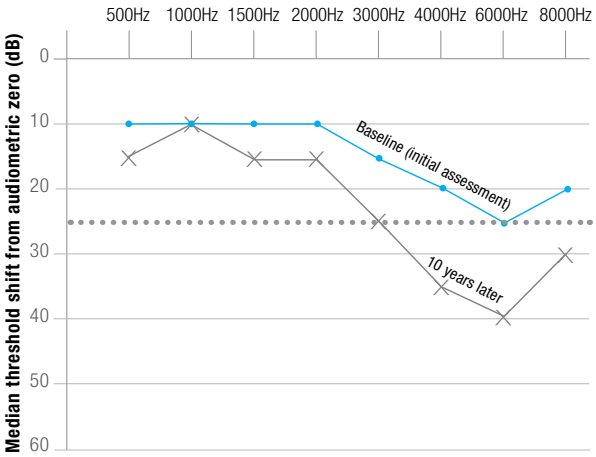
The human ear can detect sound frequencies between 20 and 20,000 Hertz.

Noise-induced hearing loss occurs at the higher frequencies initially.

Significant threshold shifts and hearing loss become most apparent from 40 to 49 years of age. It is well known among audiologists that the rates of hearing loss increase dramatically in this age range — this is mirrored in the MineHealth hearing test data.

A comparison of the median hearing threshold of people entering the Western Australian mining industry when aged between 40 to 49 years of age shows how dramatic the losses are ten years later.

MEDIAN THRESHOLD SHIFTS FOR THOSE AGED 40 TO 49 AT INITIAL ASSESSMENT



What do these hearing tests tell us? It is really important to protect your hearing early and always, whether at work, home, rest or play.

GETTING HOLD OF YOUR HEARING TEST

If you did not keep a copy of your hearing test, ask your employer to provide you with a copy. Alternatively contact Resources Safety and request a copy of your hearing test. Prior to May 2006, it was not mandatory for hearing tests being undertaken for MineHealth health assessments to be submitted to WorkCover WA. Therefore, if you are unsure when or if your baseline hearing test has been registered with WorkCover, it is recommended that you contact them directly.

POISONED EARS

Ototoxins are “ear poisons”, and may come from workplace chemicals, medications or social exposure to alcohol.

Inhalation of some ototoxin chemicals can cause hearing loss, independent of noise exposure, by damaging the cochlea in the inner ear, auditory pathways or both. Some ototoxins amplify the effects of noise-induced hearing loss. Others can be absorbed through the skin and significantly add to the ill effects.

Potential workplace ototoxins include toluene, xylene, n-hexane, organic tin, carbon disulfide, mercury, organic lead, hydrogen cyanide, diesel fuel, kerosene fuel and white spirit (Stoddard solvent).

A hearing injury is more likely if a person is exposed to a combination of chemicals or chemicals and noise. Noise and ototoxins often combine in the following activities:

- painting
- printing
- construction
- manufacturing of metal, leather and petroleum products
- fuelling vehicles and aircraft
- firefighting.

Sources of information:

NIOSH – NORA

The US-based National Institute for Occupational Safety and Health, through its National Occupational Research Agenda (NORA), has identified ototoxin-induced hearing loss as a priority area. According to NORA, “Noise is the most important occupational cause of hearing loss, but solvents, metals, asphyxiants, and heat may also play a role.”

www.cdc.gov/niosh/topics/noise/research/noiseandchem/noiseandchem.html

www.cdc.gov/niosh/docs/96-115/diseas.html#hearings

USACHPPM

The US Army Center for Health Promotion and Preventive Medicine has also published information on ototoxins.

chppm-www.apgea.army.mil/documents/fact/51-002-0903.pdf

MANAGING FATIGUE IN MINING

District Inspector of Mines Adrian Lang has a personal research interest in the subject of fatigue and its potentially adverse consequences for mining industry employees and their families. He recently submitted a thesis for a Master of Mineral Resources (Minerals Industry Risk Management) at The University of Queensland. He shares here some of his research findings on the importance of a strategy for fatigue management at mine sites.

Fatigue in the minerals industry of Western Australia is a greatly under-recognised issue that has potentially serious consequences for shift workers both at work and home. A review of the literature reveals the elusive nature of fatigue, something that most people have probably experienced at some time in their lives. It is a diffuse sensation accompanied by feelings of lethargy and a lack of interest in any activity. A major symptom is a general sensation of weariness. Fatigue cannot be measured directly and studies rely on subjective estimates.

Potentially life-threatening consequences can result when shift workers perform under the influence of fatigue. Fatigue and sleepiness have the power to kill if not treated with the respect they deserve.

A cross-sectional survey of five underground mines has provided a better understanding of site fatigue risk management strategies and the views of managers and shift workers on their sleep and shift schedules. Four of the mines provided information on their fatigue risk management procedures. Ten underground mining crews comprising 147 shift workers provided their views via an anonymous survey questionnaire administered at each mine at the start of shift.

Shift worker sleep at the five Western Australian mines compared well with mines in Tasmania, New South Wales and Queensland. However, it was found that frequently waking earlier than intended was the most widely reported sleep concern for shift workers on day shift, night shift and days off. Falling asleep whether on day or night shift demonstrates that fatigue is not an issue confined to night shift.

Mine fitness-for-work procedures focused primarily on the issues of shift schedules, hours of work, and alcohol and other

drugs. The level of detail provided on fatigue risk management was considered to be less than adequate when compared with that provided for the previous three issues and fatigue risk management documentation sourced from the mining and transport industries. The survey data and fitness-for-work procedures provided by four of the mines suggest that considerably more work needs to be done to recognise and address sleep quantity and quality, as well as sleepiness and fatigue experienced by shift workers while on shift and at home on rest days.

There is a serious need for the Western Australian minerals industry to recognise the vital importance of sleep to shift workers during their shift schedule and rest days. A concerted and ongoing campaign by industry is essential to raise and maintain the awareness of sleep as a key element in fitness for work.

TV SERIES WORTH A LOOK

Adrian is impressed with an SBS two-part documentary, *Dead Tired*, that ran recently. The first episode, *Awake is the New Sleep*, covered the need for a better understanding of the importance of sleep, as well as nutrition and exercise, in our lives. The second episode dealt with insomnia, now the world's most common medical disorder. Details can be found at www.sbs.com.au

The issue of sleep deprivation and fatigue are part of the broader "fitness for work" issue that the mining industry is starting to recognise and address. Employees, employers and the regulator all need to be involved, and look more broadly than just the hardware used in the industry. We are all generally familiar with the engineering aspects — it is now timely to familiarise ourselves with the human factors.

WORKING HOURS GUIDANCE

Following on from the State Government's 2003-04 review of extended working hours, a code of practice on working hours was launched in 2006. This code is jointly published by WorkSafe and Resources Safety and applies to all Western Australian workplaces covered by either the *Occupational Safety and Health Act 1984* or *Mines Safety and Inspection Act 1994*.

Although guidance material had been available in the past, this was Australia's first comprehensive code of practice, providing guidance on a range of issues associated with working hours.

It addresses fatigue and impaired performance and other safety and health risks, such as exposure to hazardous substances, that may arise from some working hours arrangements. The code emphasises going through the risk management process and developing industry- and workplace-specific control measures.

The code of practice, with accompanying working hours risk management guidelines, can be downloaded from the Resources Safety website. Hardcopies may be purchased from the Publications Officer at the Department of Commerce (ph. 08 9327 8721, email publications@commerce.wa.gov.au).

FIFO RESEARCH UPDATE

The May 2008 issue of *MineSafe* (vol. 17, no. 1) reported on a large research project then underway at The University of Western Australia. Susan Clifford, a PhD candidate, was examining the impacts of fly-in fly-out (FIFO) arrangements on the stress levels, lifestyles and health of Western Australian mining employees and partners.

The December 2008 issue (vol. 17, no. 3) covered other FIFO research and indicated that there would be an update on Ms Clifford's research. Susan advises that her doctoral thesis has now been submitted and she has prepared a summary paper. Information from this paper will be extracted for a feature article in the December 2009 (vol. 18, no. 3) issue.

NORM IN THE NEWS

The Department of Mines and Petroleum recently informed industry of the strong regulatory requirements for Western Australian uranium exploration and mining at a briefing on 30 July.

The day-long workshop was an opportunity for the Department and Commonwealth agencies to outline State and Federal legislation and regulations applicable to uranium operations.

Department of Mines and Petroleum Director General Richard Sellers said the department had formed an interagency working group, which had investigated what changes to existing legislation or additional regulations were needed for uranium mining and exploration.

"The group identified that Western Australia's current regulatory framework does, in combination with international and Commonwealth legislation, guidelines and policies, provide for the development of uranium mining and associated activities," Mr Sellers said.

IF

"The State has a long history of regulating radioactive substances. These decades of regulatory experience, combined with world-best guidelines for managing naturally occurring radioactive materials (NORM), mean Western Australia is ideally positioned to regulate the uranium industry to the highest standards."

State's uranium resources

Western Australia has known resources of 193,000 tonnes of uranium oxide in 29 projects and has significant potential for additional deposits to be discovered with many promising areas yet to be tested.

Australia has 36 per cent of the world's reasonable assured resources of uranium, of which Western Australia has five to eight per cent with many prospective areas yet to be explored. This means the State has the potential to become a significant global supplier of uranium at a time when the world is building hundreds of reactors.

According to the World Nuclear Association, as at 1 June 2009, there were 436 operating nuclear reactors worldwide, 45 under construction, 131 on order or planned and 278 proposed.

In Western Australia, five resource companies have mining projects that are already significantly advanced, with some of the projects expected to commence mining in or after 2012.

Regulation of the industry

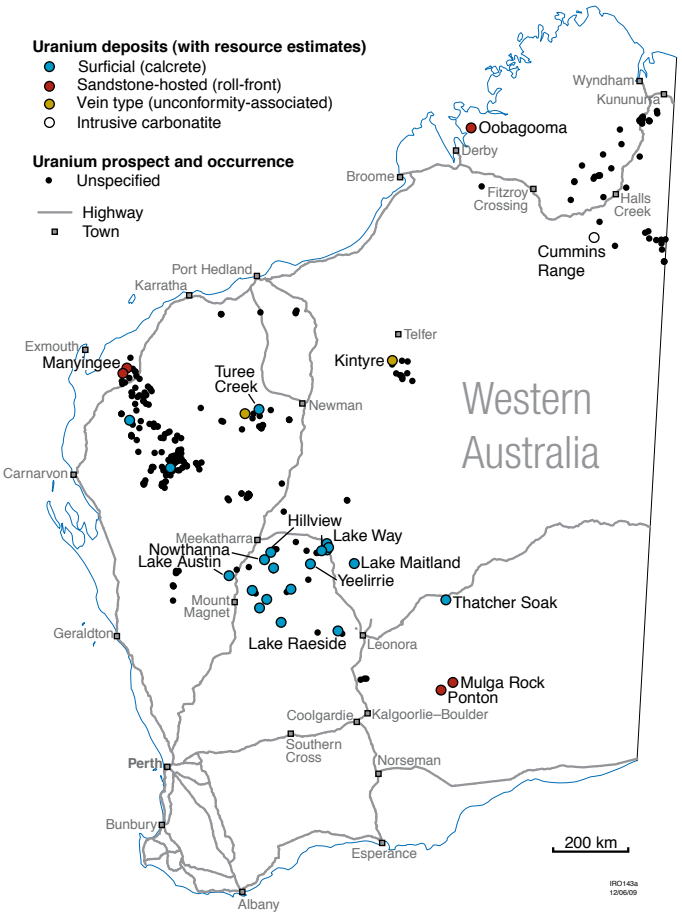
The regulators and mining industry in Western Australia have a long history of working with radioactive minerals, including mineral sands, rare earth minerals and tantalum concentrates, which have been extracted, processed, transported and exported from the State for some 40 years.

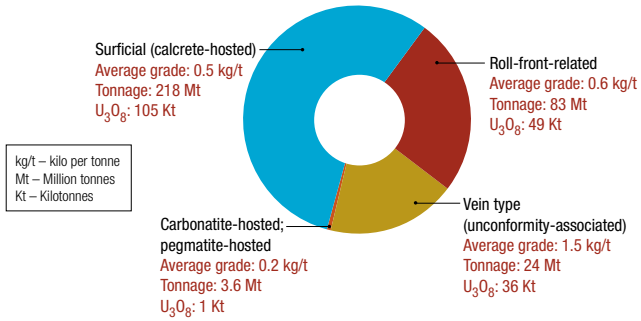
These operations are already strictly regulated under the Mines Safety and Inspection Regulations 1995 and *Radiation Safety Act 1975*, which are administered by the Department's Resources Safety and Environment Divisions, and the Radiological Council of Western Australia, respectively.

Mineral sands workers have the most up-to-date workplace health information, which is considered a benchmark for radiation safety practices by industry experts world-wide.

The regulatory framework for transportation of material from uranium mining sites is regulated by Commonwealth, State and Territory jurisdictions. The framework currently abides by the *Code of Practice for the Safe Transport of Radioactive Substances 1990*. This code was formulated under the provisions of the *Environment Protection (Nuclear Codes) Act 1978* and is based on international guidelines for the transportation of radioactive material.

An interagency uranium working group was formed in February 2009 and includes representatives from the Departments of Mines and Petroleum, Health, State Development, and Environment





Uranium resources categorised in the main mineralisation styles
Source: DMP Minerals Database (MINEDEX) , extracted 12 June 2009

and Conservation, and the Environmental Protection Authority Service Unit. The working group's objective was to review current legislation and regulations, and identify the additional technical resources required to deal with uranium mining.

Western Australia has also been meeting with the South Australian and Northern Territory governments to learn from their experience in monitoring and regulating uranium mining.

Uranium Industry Framework

The Uranium Industry Framework (UIF) Steering Group was initiated in 2005 in partnership with Commonwealth, South Australian and Northern Territory Governments, and other key stakeholders to assist in further developing the uranium industry over the short, medium and long term, while maintaining the highest safety and environmental standards. The UIF focuses exclusively on issues directly related to the exploration, mining, milling and transportation of uranium.

In January 2007, the UIF Implementation Group was established as a joint industry–government body to implement the 20 recommendations made in the UIF report of 2006.

The framework is guided by four main aims:

- increasing Australia's international competitiveness;
- facilitating increased mining and exploration of uranium;
- ensuring consistent, effective and efficient regulatory regime for the mining of uranium; and
- encouraging a wider community understanding and acceptance of the economic and social benefits.

Further information

The recent industry event is the first of many intended briefings with stakeholders in the uranium sector, including regional and indigenous communities.

Further information on the workshop and uranium is available from the departmental website at www.dmp.wa.gov.au or contact Resources Safety's Director Health Management, Mike Rowe (ph. 08 9358 8091, mike.rowe@dmp.wa.gov.au) or Senior Scientific Officer, Ivan Fetwadjieff (ph. 08 9358 8086, ivan. fetwadjieff@dmp.wa.gov.au).

TALKING ABOUT DUST CONTROL

As mentioned in the last issue of MineSafe, Resources Safety is currently examining dust management in exploration drilling. The project is managed by Chris White, Principal Scientific Officer.

A forum for interested parties was held recently, after the 2009 Exploration Safety Roadshow, to share ideas, discuss challenges and determine timelines for meeting the project's objectives.

Chris is keen to hear from anyone else interested in practical controls for drill rig dust and exploring options for best practice and innovation. Contact him (ph. 08 9358 8092, chris.white@dmp.wa.gov.au) for further information about joining an online discussion group.

CW

IS IT HAZARDOUS OR DANGEROUS?

Hazardous substances

Hazardous substances are those that, following exposure, can have an adverse effect on health. Examples of hazardous substances include poisons, substances that cause burns or skin and eye irritation, and substances that may cause cancer.

Hazardous substances used at mining operations in Western Australia are regulated under the Mines Safety and Inspection Regulations 1995, which are administered by Resources Safety.

Hazardous substances at non-mining workplaces are regulated under the *Occupational Safety and Health Act 1984* and attendant regulations, which are administered by the WorkSafe Division of the Department of Commerce. Many hazardous substances are also classified as dangerous goods.

Dangerous goods

Dangerous goods are substances or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment. In Western Australia, these are defined in the *Dangerous Goods Safety Act 2004* and subsidiary legislation, which are administered by Resources Safety.

Generally, classification of dangerous goods is outlined in the *Australian Code for the Transport of Dangerous Goods by Road and Rail, Seventh Edition*, published in 2007 (ADG7), which is closely aligned with international requirements of the United Nations Recommendations on the Transport of Dangerous Goods.

In Western Australia, there are a few additional requirements, such as all sulfur being a dangerous good for storage and handling, irrespective of form (such as lump sulfur). Also, C1 combustible liquids (such as diesel fuel) are classified as dangerous goods for storage purposes, but not for road and rail transport.

There are nine classes of dangerous goods, based on their hazardous properties, some of which are further divided into divisions. These are labeled accordingly. There are also goods too dangerous to transport and C1 combustible liquids.

The Western Australian dangerous goods safety legislation covers the following Classes and Divisions of dangerous goods:

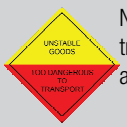
- Class 1 (explosives);
- Class 2 (gases);
- Class 3 (flammable liquids);
- Class 4 (flammable solids, substances liable to spontaneous combustion, substances that in contact with water emit flammable gases);
- Class 5 (oxidising substances, organic peroxides);
- Division 6.1 (toxic substances);
- Class 8 (corrosive substances);
- Class 9 (miscellaneous dangerous goods and articles);
- Goods too dangerous to be transported (see appendix A of AGD7); and
- C1 combustible liquids (combustible liquid with flashpoint between 60.5 and 150°C.)

Notable omissions from the list are:

- Division 6.2 (infectious substances); and
- Class 7 (radioactive substances).

Table showing dangerous goods placards and highlighting those Classes and Divisions regulated by Resources Safety.

PLACARDS	DESCRIPTION	EXAMPLES, WHERE USED
	Class 1 - Explosives	Detonators, emulsion explosives, fireworks, flares, ammunition Mining, fireworks displays
	Division 2.1 – Flammable gases *Easily ignited and readily combustible*	LP gas, acetylene, LNG Welding shops, barbecues, gas depots
	Division 2.2 – Non-flammable non-toxic gases	Carbon dioxide, nitrogen, argon Hospitals, engineering workshops
	Division 2.3 – Toxic gases Poisonous	Ammonia, chlorine, methyl bromide Swimming pools, sewage plants, refrigeration plants, fumigation

	Class 3 – Flammable liquids *Easily ignited and readily combustible*	Petrol, acetone, ethanol Service stations, fuel terminals, paint stores
	Division 4.1 – Flammable solids *Easily ignited and readily combustible*	Sulfur, firelighters, matches Chemical plants, wood barbecues
	Division 4.2 – Spontaneously combustible substances *Can burst into flames without being lit*	Xanthates, sodium hydrosulphide Mining, research laboratories
	Division 4.3 – Water reactive substances *Produces flammable or toxic gases if wet or reacts violently if mixed with water*	Aluminium phosphide, calcium carbide Agriculture, industry
	Division 5.1 – Oxidizing agents *Although not necessarily combustible themselves, can cause or contribute to combustion of other material*	Calcium hypochlorite, ammonium nitrate Swimming pools, mining, industry
	Division 5.2 – Organic peroxides *Thermally unstable and liable to react violently with other material*	Methyl ethyl ketone peroxide (MEKP), benzoyl peroxide Polymer industry, fibreglass manufacture
	Division 6.1 – Toxic substances *Poisonous*	Sodium cyanide, dicholoromethane, toluene diisocyanate, some pesticides Mining, agriculture
	Division 6.2 – Infectious substances	Pathology specimens, AIDS virus, clinical waste Hospitals, research laboratories
	Class 7 – Radioactive material	Uranium, 137Cesium, 60Cobalt, 241Americium Hospitals, research laboratories, industry, mining Further information available from Department of Health
	Class 8 – Corrosive substances *Causes tissue burns or severely corrodes certain metals*	Hydrochloric acid, sodium hydroxide, sulfuric acid Chemical industry, mining, swimming pools
	Class 9 – Miscellaneous dangerous goods *Presents a danger not covered by other Classes*	Dry ice, asbestos, expandable polymeric beads
 Not applicable for transport as generated and used on site	Goods too dangerous to transport *Too dangerous to transport because of instability and potential to react violently*	Styrene monomer (without inhibitor), nitroglycerin, nickel picrate Chemical industry, research laboratories
Not required to be labelled for COMBUSTIBLE LIQUID C1	C1 combustible liquids *Liquids that burn but more difficult to ignite than flammable liquids*	Diesel fuel Service stations, fuel terminals, mining

ELECTRICAL LOG BOOKS NOW AVAILABLE

All electrical work on mine sites must be entered into an electrical log book. Log book entries include:

- all electrical installation work;
- details of any electrical shocks or burns to a person;
- details of fires caused by electricity and any other dangerous occurrences involving electricity; and
- results of statutory testing of electrical equipment.

A new batch of electrical log books, suitable for use on mine sites, is now available. Once an existing log book is full, mine managers or electrical supervisors should contact Resources Safety (ph. 08 9358 8079, MinesSafety@dmp.wa.gov.au) to obtain a new book.

RESOURCES SAFETY ALERT TO SERIOUS INCIDENTS

As part of the Department of Mines and Petroleum's role to administer safety in Western Australia's resources sector, Resources Safety routinely issues safety alerts to disseminate information and knowledge about hazards.

Safety bulletins address issues or hazards identified at one or several sites that have industry-wide implications but may not be generally recognised, or report on the Coroner's findings.

Significant incident reports cover specific accidents or occurrences to raise awareness of lessons learned.

The safety alerts are uploaded to the accidents and incidents section of Resources Safety's website as soon as they are signed off. They are also reproduced in *MineSafe*.

This issue contains four mines safety significant incident reports, four mines safety bulletins, a petroleum safety significant incident report and two dangerous goods safety bulletins.

There are common themes running through some of the safety alerts, despite the different industry settings:

- falls — people and objects;
- explosives — misfires and underground magazines; and
- electricity – equipment coming into contact with power lines and buried cables.

One of the mines safety bulletins outlines how to avoid a specific steering box failure in vehicles on mine sites. It follows up an incident investigation report prepared by a mine after a "sector shaft" in a steering box sheared, resulting in total steering failure. When released online, the bulletin generated immediate feedback, with one correspondent from Queensland commenting that his business only used new genuine sector shafts due to the problems mentioned in the bulletin.

NSW ISSUES WARNING AFTER COLLAPSE OF DRILL RIG MAST

The New South Wales Department of Primary Industries has issued Mines *Safety Report No. SA09-07* regarding the structural failure and collapse of a drill rig mast. The mast on an open cut blast hole drill rig collapsed suddenly when the operator attempted to lower the mast before moving the rig off the drill bench.

The operator had unlocked the mast locking pins and was lowering the mast when the lower pivot points on the mast failed, causing it to collapse. The drill was substantially damaged but there were no injuries.

An onsite inspection concluded that the mast pivot points had failed where the bearing blocks were welded onto two rectangular hollow section (RHS) vertical supports. Additional cracking was observed at the base of the bearing block support steel work.

Among the recommendations made in the safety alert are:

- include, as part of the operator's pre-operational checks, an inspection of the mast pivot points, pivot shaft and supporting structure for any visual signs of cracking or component failure;
- include more detailed visual inspections of all critical elements as part of all period maintenance checks;
- consult with the original equipment manufacturer (OEM) about the frequency of non-destructive testing (NDT) of critical elements; and
- develop exclusion zones around the plant whenever the mast is being raised or lowered before ramming or servicing.

The full list of recommendations and other incident details are available at **www.dpi.nsw.gov.au/minerals/safety/safety-alerts**

This problem is not new. In 1994 in Western Australia, similar incidents were highlighted in Mines Safety Significant Incident Report No. 51 *Failure of mast supports on drill rigs*, available from the Resources Safety website in the accidents and incidents section. The structural inspections and testing recommended in the report would form part of the maintenance system for drilling equipment as listed in part 8 of the *Exploration Safety HIF Audit* guideline and template, available from the publications section of the Resources Safety website.

TAXONOMY REPORT HAS SERIOUS FOCUS

Several years ago, the Chamber of Minerals and Energy Western Australia Inc. commissioned a report on a taxonomy study on fatalities in the Western Australian mining industry during the period 1970-2006. The taxonomy focused on the damaging energy exchange at the root of the fatality, and examined both surface and underground incidents. This 2006 report, prepared by Roger Kahler of The InterSafe Group, is available from the occupational safety and health section of the Chamber's website at www.cmewa.com

The 2006 report was further developed by Roger Kahler, with input from Brendan McDougall, Charlotte Nash-Stewart and Holun Kei, and looked at serious injuries and incidents, as well as "near misses" (potentially serious occurrences). It was released as four volumes in late 2008:

1. *A taxonomy of 809 WA mining industry non-fatal incidents (≥60 days lost) 2003–2007* – Dataset Western Australia WorkCover
2. *A taxonomy of 548 WA mining industry non-fatal incidents (≥60 days lost) July 1996–June 2006* – Dataset WA Department of Consumer and Employment Protection (DOCEP) – Resources Safety/Mining
3. *A taxonomy of 671 "potentially serious" occurrences for surface and underground in WA mining 2003–2004* – Dataset WA Department of Consumer and Employment Protection (DOCEP) – Resources Safety/Mining
4. *Capturing the learnings from a study of 82 WA mining fatalities 1990-2006, 809 non-fatal incidents (≥60 days lost) 2003-2006, and 671 "potentially serious" occurrences 2003–2004* – Datasets Western Australia WorkCover and WA Department of Consumer and Employment Protection (DOCEP) – Resources Safety/Mining

The purpose of the later report was to complete a pattern analysis of the more seriously injured people (non-fatal; 60 or more days off work) and potentially serious occurrences arising from Western Australian mining activities.

Initiated by The InterSafe Group but supported by Rio Tinto Expansions Projects and Leighton Mining – HWE Mining with the full cooperation of WorkCover WA, the 2008 report provides useful insight into where industry can focus its efforts, and can be used for identifying new strategies, developing programs, identifying existing training and management gaps, and for induction and training purposes.

In particular, Volume 1, which contains the executive summary, may be a useful resource for managers, supervisors, safety officers and representatives, and educational institutions so they can review the patterns and consider their application to specific workplaces or activities. In Volume 4, the author describes the observations and strategies that could be useful for the prediction and management of fatal and non-fatal permanent damage. He invokes the Pareto principal, or 80/20 rule, when dealing with the energies that can kill — roughly 80% of the effects come from 20% of the causes, so focus on those particular causes to maximise the desired response.

Contact InterSafe (ph. 07 3895 8111, enquiries@intersafe.com.au, www.intersafe.com.au) for further information about this publication.

WHAT IS TAXONOMY?

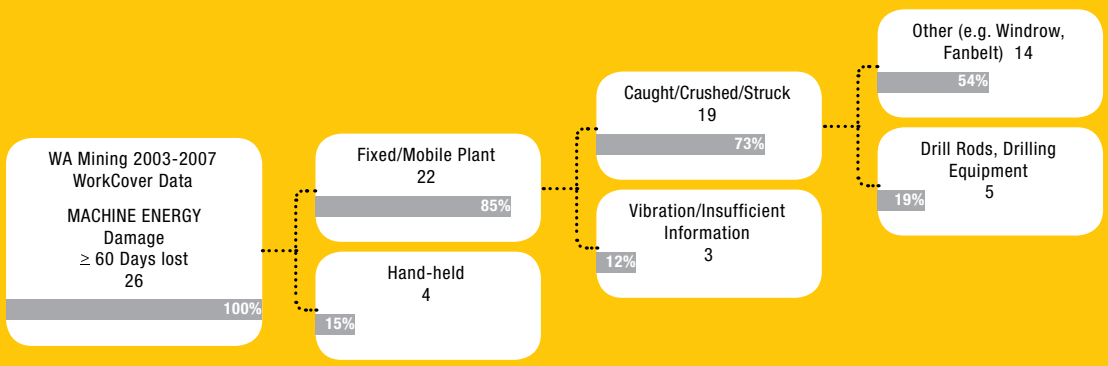
Taxonomy is the practice and science of classification according to a pre-determined system, with the resulting catalogue used to provide a conceptual framework for discussion, analysis, or information retrieval. In theory, a good taxonomy takes into account the importance of separating elements of a group into subgroups that are mutually exclusive, unambiguous and, taken together, include all possibilities. In practice, a good taxonomy should be simple, easy to remember, and easy to use.

A well known example is that of Swedish scientist, Carl Linnaeus, as set out in his *Systema Naturae* (published 1735) and subsequent works. His taxonomy comprised three kingdoms (animals, plants, minerals), divided into classes, then orders, genera (singular genus), and species (singular species), with an additional rank lower than species.

The creation of taxonomies is very important in safety research. For example, there are numerous taxonomies to classify and analyse human error and accident causes, such as the Human Factors Analysis and Classification System (HFACS).

HFACS is based on Reason's "Swiss cheese model" of human error. It is a comprehensive framework that translates Reason's ideas into an applied setting, with 19 causal categories defined within four levels of human failure — unsafe acts, preconditions for unsafe acts, unsafe supervision and organisational influences.

An example from Kahler's 2008 report is the taxonomy for machine energy, identified as one of the damaging energy sources for serious injuries – others include human, gravitational, vehicle and chemical.



Source: Figure 27 of Kahler et al., 2008. Taxonomy: WA WorkCover - machine energy

USUAL SUSPECTS SHOW UP IN MID-YEAR STATS

An effective approach to safety management is one that is evidence- and risk-based, and focused on reducing the likelihood of a serious incident or injury in all aspects of the industry's activities. Serious injuries may permanently or temporarily affect a person's life.

Reportable serious lost time and disabling injury data collated by Resources Safety for 1 July to 31 December 2008 is summarised here to provide a snapshot of industry performance for the first half of the reporting year. The annual compilation of all 2008-09 data should be available later this year.

An examination of the first six months of data shows that, on the basis of workforce numbers, serious injuries to underground workers are over-represented in comparison to those reported for surface workers.

As is typical of the annual compilations over the past few years, backs, hands and shoulders are the parts of the body most commonly seriously injured, and strains, sprains and fractures lead the nature of injury statistics.

For underground workers, the development and production areas continue to be the places where most serious injuries occur. On the surface, the "bench area", which includes drill pattern and heavy vehicle park-up areas, features in many reports, with injuries mainly related to drilling and blasting activities and getting into and out of heavy mobile equipment. Other significant areas on the surface are those relating to mineral processing and face loading.

Being struck by an object joined overexertion and strenuous movement, caught by or between objects and slips and trips as the most common type of accident for the first half of 2008-09.

Although not included in annual industry performance compilations, it is interesting to consider the activity being undertaken when a serious injury was sustained or, particularly for musculoskeletal disorders, noticed.

The serious injury reports for the period under consideration indicate that the most common activity was "moving or travelling". This is when a person is mobile, including walking, climbing or accessing a vehicle. Moving objects and lifting are also significant. Another common activity category for serious injuries is "stationary", which includes standing, observing, twisting and bending.

It should be noted that a single event of exertion when performing a hazardous manual task can result in a musculoskeletal disorder, such as a strain or sprain. More commonly, however, such injuries are caused by cumulative "wear and tear" on the musculoskeletal system so the activity at the time of the injury may not have been responsible for most of the "damage".

NUMBER OF INJURIES

Between 1 July and 31 December 2008, there were 367 serious lost time and disabling injuries, of which 313 were sustained by surface employees (workforce of 66,532) and 54 by underground employees (workforce of 7,642).

The serious injuries are categorised below and listed from most to least common.

>> significantly more injuries than for next category

≈ number of injuries is similar

PART OF BODY INJURED

Back > Hand > Shoulder > Ankle > Knee > Neck ≈ Foot or toes

NATURE OF INJURY

Strain or sprain >> Fracture or break > Bruise or contusion > Crushing > Laceration ≈ Dislocation

PLACE OF INJURY

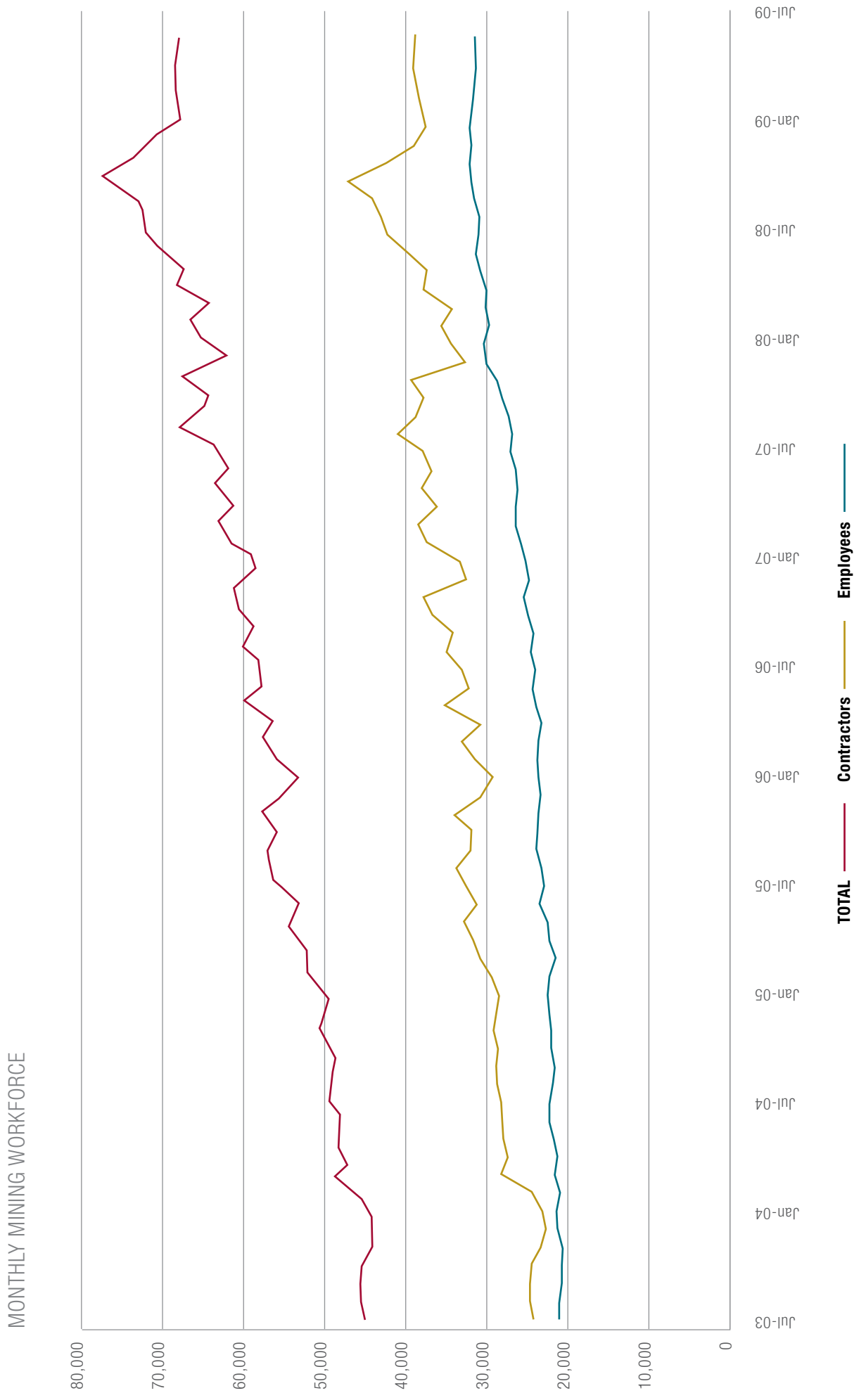
Underground production or development area > Bench area (not haulroad) > Crushing, screening or conveyor ≈ Face loading area > Heavy equipment workshop > Workshop > Smelter, roaster or furnace area ≈ Storage yard or rebuild area

TYPE OF ACCIDENT

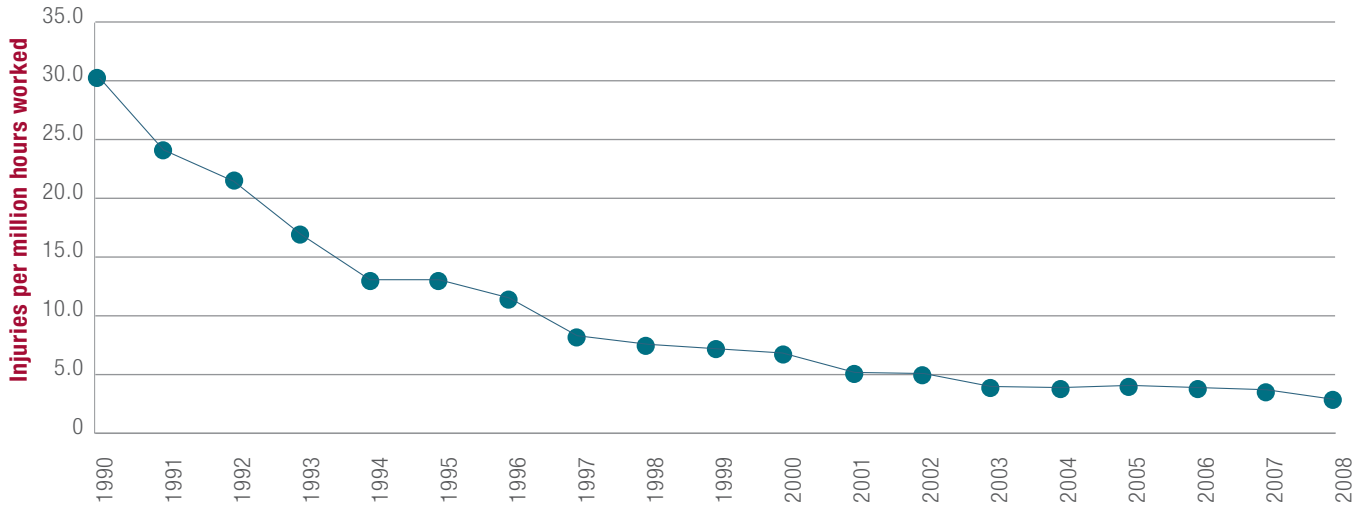
Struck by object (not rock or coal) > Caught by or between object (not machine) ≈ Stepping (person, no fall) ≈ Fall, slip or trip (same level) > Over-exertion (no object involved) ≈ Over-exertion (lifting unassisted) > Motor vehicle or equipment jolting or jarring

ACTIVITY WHEN INJURY SUSTAINED OR NOTICED

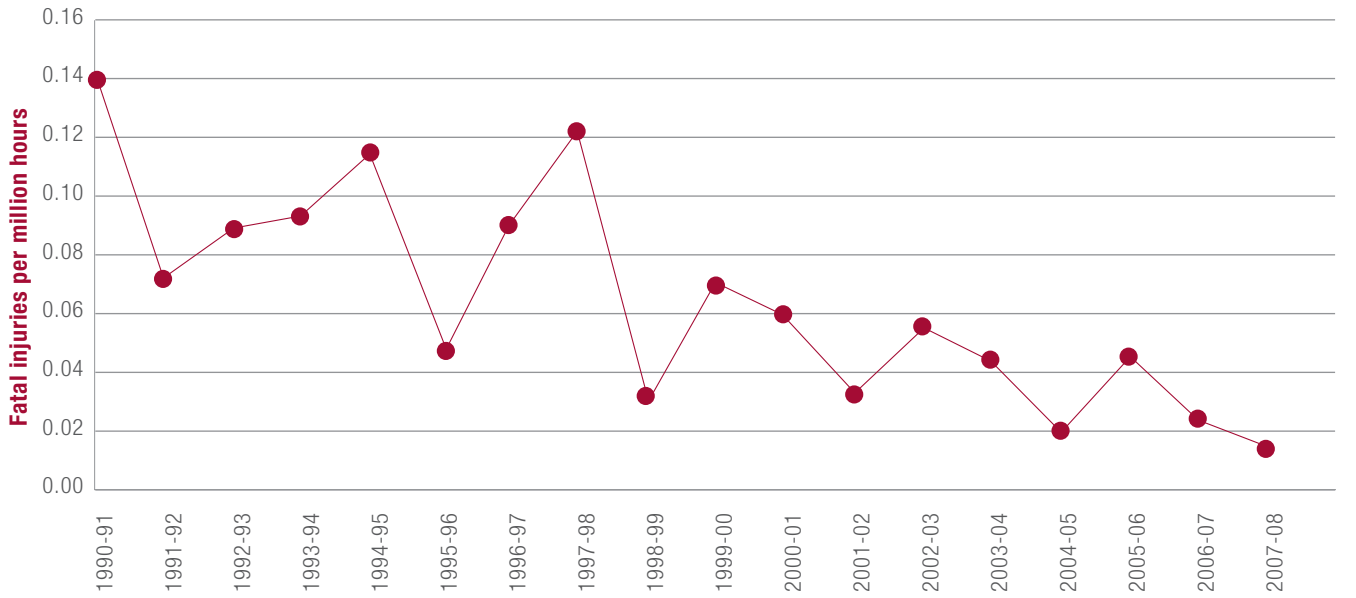
Moving or travelling > Moving object or equipment > Lifting > Stationary (not using tools) > Surface hauling ≈ Metalworking > Hammering


MONTHLY MINING WORKFORCE
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
TOTAL
Contractors
Employees

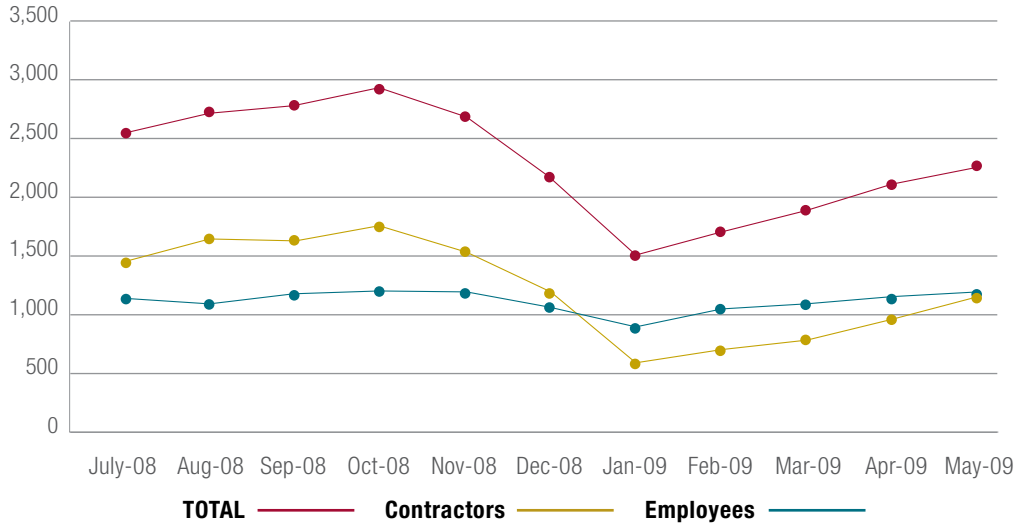
LOST TIME INJURY FREQUENCY RATE - ALL MINING



FATAL INJURY FREQUENCY RATE - MINING EXCLUDING EXPLORATION



MONTHLY EXPLORATION WORKFORCE



ERRATUM

On page 42 of the May 2009 issue of *MineSafe* (vol. 18, no. 1), the article referred to a monthly peak in October 2009 of 78,000. The monthly peak was actually recorded in October 2008 – we were not attempting to predict workforce figures for later this year!

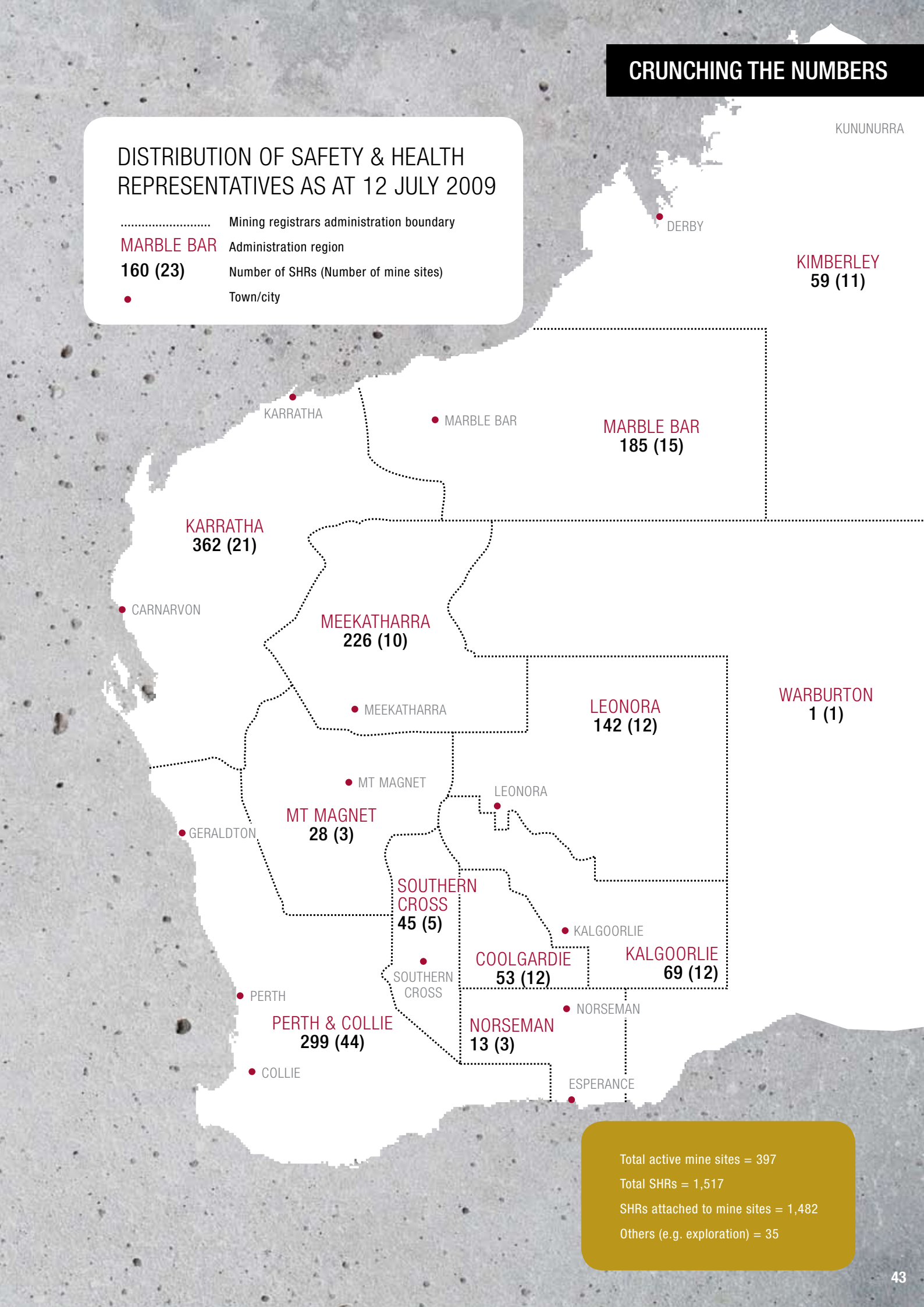

DISTRIBUTION OF SAFETY & HEALTH REPRESENTATIVES AS AT 12 JULY 2009
..... Mining registrars administration boundary
MARBLE BAR Administration region
160 (23) Number of SHRs (Number of mine sites)
Town/city
KUNUNURRA
DERBY
KIMBERLEY
59 (11)
KARRATHA
MARBLE BAR
MARBLE BAR
185 (15)
KARRATHA
362 (21)
CARNARVON
MEEKATHARRA
226 (10)
MEEKATHARRA
LEONORA
142 (12)
WARBURTON
1 (1)
MT MAGNET
LEONORA
MT MAGNET
28 (3)
GERALDTON
SOUTHERN CROSS
45 (5)
KALGOORLIE
COOLGARDIE
53 (12)
KALGOORLIE
69 (12)
SOUTHERN CROSS
PERTH
NORSEMAN
PERTH & COLLIE
299 (44)
NORSEMAN
13 (3)
COLLIE
ESPERANCE
Total active mine sites = 397
Total SHRs = 1,517
SHRs attached to mine sites = 1,482
Others (e.g. exploration) = 35

Photo courtesy Tiwest Cooljarloo. *Left to right:* Andrew Extract (Resources Safety), Glenn Baskerville, David Sawyer, Samantha Jones, George Adams, George Babarskas, Gary Dunn, Craig Alexander, Prasanna Monaragala, Daniel Rieusset Absent: Mark Dell, Chris Mould, Tony Grieve

EXTRACTING THE MOST FROM SAFETY MEETINGS

Resources Safety is always keen to hear from safety and health representatives and committees about their activities. Here, Martin Mclaughlin, Group Safety Leader at Tiwest Cooljarloo, tells us about how his site keeps meetings interesting and accessible.

Tiwest Cooljarloo safety representatives meet offsite on a quarterly basis — this forum gives them an opportunity to gather as a group to discuss site issues and look at ways safety can be improved.

Due to a variety of rosters on site, the quarterly forum has proved important as it provides a dedicated time when all the safety representatives can get together to contribute and brainstorm ideas. Given the high turnover of personnel on site in recent times, the different setting also gives safety representatives a chance to get to know each other without the interruption of work.

An initiative for 2009 is to invite a guest speaker to each meeting to assist in developing the role and profile of the safety representatives on site. District Inspector of Mines Andrew Extract recently attended the May meeting and discussed the role of the Department of Mines and Petroleum and the role of elected safety and health representatives from Resources Safety's perspective, and how Resources Safety, employees and employers need to work together to maintain a safe workplace.

PRACTICAL GUIDE TO ASSIST FAMILIES

Many Western Australian families are choosing a lifestyle where one parent works away. Some families adapt easily to this lifestyle whereas others can find it hard to adjust to the unique emotional cycle of the comings and goings.

In response to feedback received from mothers, the Department for Communities' parenting services, Parenting WA, has developed a practical guide to assist families when one parent works away.

A first for the State Government, the booklet was developed in consultation with parents and researchers Drs Anne Sibbel and Elizabeth Kaczmarek.

Dr Sibbel is a community psychologist and researcher on fly-in fly-out (FIFO) workers. The December 2008 issue of *MineSafe* (vol. 18, no. 3) reported on her work in a special feature on the impact of FIFO. Dr Kaczmarek is a psychology lecturer at Edith Cowan University.

Support for Mum when Dad works away contains practical information such as tips for self-care, advice on how men and women can manage their relationship and their role together as parents, and lists contact details for support resources and facilities.

The booklet is also a great resource for employers and community organisations that work with these families.

Helen Creed, Executive Director of Children and Family Services, hopes that *Support for Mum when Dad works away* will benefit many Western Australian families and assist in the development of strong, vibrant communities.

Copies of the booklet can be downloaded from www.communities.wa.gov.au or by telephoning Parenting WA (ph. 08 6279 1200, country areas 1800 686 155).

NEW CHAIRMAN LEADS 2009 COMPETITION

A new leader has paved the way forward for a successful Surface Mine Emergency Response Competition held in Kalgoorlie on 2 and 3 May this year.

Brad Stearnes is the newly appointed chairman of the Eastern Regional Council Mines Rescue Committee (ERCMRC), the key organisers of the competition, which is run under the auspices of the Chamber of Minerals and Energy of Western Australia.

He stepped up to the role after spending the previous two years as one of the ERCMRC's deputy chairmen.

Although undertaking the lead role during some economic challenges currently being experienced by the resources industry, Brad still led the way forward to a very successful and well received competition.

Brad said that although the current economic challenges had affected local team numbers joining the competition, it was an opportunity to open the door for teams in the South West Region and rest of Australia to participate.

"A few of the previous local competing teams have had their mine sites shut down. However, we have now seen more teams from Western Australia's South West, and even a team from New South Wales join this year's competition," he said.

"Our competition has a very good reputation around Australia as being one of the premier events of its kind. New South Wales teams have been trying to participate in the past and the spaces this year gave them the opportunity to join."

The annual competition has been taking place in the Goldfields since 1911 and has become one of the largest of its kind in the southern hemisphere.

Brad said that all the help and equipment provided was voluntary, and many companies were willing to put their hand up to help.

He said the man hours that go into preparing the event are huge, with a lot of help from volunteers, sponsors and other resources companies often going unnoticed.

"You spend a lot of time at work organising the event and so do a lot of the other event managers," he said. "This is one way the companies give to the competition by allowing us to organise for the event at work — and that is the company support that

TYC Brad Stearnes

> “EMERGENCY RESPONSE IS SOMETHING AS COMPETITION ORGANISERS WE WANT TO TRAIN THE INDUSTRY WELL IN AND BE WELL PREPARED FOR, BUT WE HOPE IT’S NOTHING TEAMS WILL EVER ACTUALLY HAVE TO GO THROUGH IN A REAL LIFE SITUATION”

often goes unnoticed.

“We have various helpers including sponsors, committee members, event managers, adjudicators, casualties and other general helpers that make the event possible.”

The ERCMRC chairman is elected each year by the committee members. Two deputy chairmen are also voted in, although there was only one deputy chairman this year.

Brad said he was still finding his feet in the role but explained there was a lot of support from older people who had been involved in the competition for a while.

“You can always call on advice and help from past chairmen, so if you have any questions or a problem, you just give them a call and they are more than happy to help you out,” he said. “The best thing about being on the committee is the network of people, it really is good the valuable knowledge and support that is around.”

Brad said that, in his role as chairman, he had been involved in liaising with Kalgoorlie’s Hall of Fame to organise locations for each scenario.

“The chief adjudicators and I are responsible for overlooking each scenario to ensure they cover all necessary safety areas,” he said.

“The ERCMRC committee met once a month for the past six months to discuss logistics for the competition.”

Brad said that, following this competition, the focus would shift to preparing for the Underground Mine Emergency Response Competition scheduled for November.

“After we have a meeting to wrap-up this competition, efforts will concentrate on finding a location and event managers for the upcoming underground event,” he said.

Brad said that both the surface and underground competitions provided huge benefits to industry, with competing teams getting as close to real life emergency response situations as they could.

“With standard on-site training, teams generally know what type of training they are going to undertake and they’re also familiar with their training areas,” he said. “The emergency response competitions take teams out of their comfort zone and really put pressure on them.

“Emergency response is something as competition organisers we want to train the industry well in and be well prepared for, but we hope it’s nothing teams will ever actually have to go through in a real life situation.”

TYC Brett Morrow

BEHIND-THE-SCENES LOOK AT SCENARIOS

Who are the minds behind the creative, realistic and challenging scenarios that teams take on during emergency response competitions? Who volunteers to think up the scenario, gather the equipment, select an appropriate location and create the score sheet to make the scenario happen? Introducing the event managers …

Each scenario at the Surface Mine Emergency Response Competition has an event manager, who is primarily responsible for organising just about everything that needs to be done behind the scenes.

The time and effort they dedicate to organising the scenario is all voluntary, and they are also required to source equipment and material, which is either donated or borrowed.

In this year's surface mine competition, there were seven scenarios — fire fighting, vehicle extrication, rope rescue, team skills, hazardous chemicals, confined space and first aid — each with its own event manager.

Here we take a look at each scenario and meet the event manager.

FIRE FIGHTING

Imagine a plane has tried to land on the runway. It has clipped a vehicle using the same airstrip. There are three casualties — two have died and one is trapped among burning flames, hanging on to her life.

Welcome to the fire fighting scenario, an idea thought up three years ago and originating from the television show *Lost*.

"We have had this scenario on paper for about three years but the actual preparation took about four to five weeks of solid work, even across the weekends," event manager Brett Morrow said.

"In that time, we built all the props and sourced material from places like the local scrap yard, as well as organised lots of paperwork, like score sheets."

Fire fighting adjudicator, Curtis Jones, was alongside Brett when the idea was created.

"I'm not much of a science fiction fan, but I started watching the show *Lost* and thought a plane with wreckage and burning would not be too hard to set up on a small scale," he said. "Then we thought fly-in fly-out — a lot of sites do it and have airstrips, so they need to be prepared if an aviation emergency was to arise.

TYC Scott Franklin and Kurt Vosselbelt

"We then realised that this sort of scenario had never been done before in a competition and was quite relevant to many mine sites, so we did it."

The fire fighting event incorporates five adjudicators, each assessing different factors such as team skills, the team captain, first aid, safety and breathing apparatus.

Brett said the benefits of competing in a scenario like this were huge as it is very difficult to set-up in normal training.

"This scenario takes 20 blokes to set up and involves refuelling, casualties and organising lots of props, something that is often too hard for regular emergency response coordinators to organise," he said.

"We also try to recreate the pressures that teams would face in a real life incident."

HAZARDOUS CHEMICALS

A few curve balls were thrown at teams in this year's hazardous chemicals scenario, forcing teams not only to deal with a chemical spill and rescue a casualty, but deal with a deceased casualty as well.

Hazardous chemicals event manager, Craig Stonham, said a lot of teams did not like having to accept they were unable to retrieve a deceased casualty, being forced to leave him behind.

"Teams found it hard to leave the deceased casualty behind but he was literally unable to be removed, and to get the second casualty out was a lot of work," he said.

Craig has been involved in the emergency response competition since 1988, first as a competitor and then as a team manager and adjudicator.

He said in his role as the event manager he was required to undertake a lot of background research on different hazardous chemicals.

"A lot work goes in behind the scenes to make sure things like the score sheets reflect the scenario well, and that all the props make the incident look realistic," he said. "You always see improvements with people who get involved and I believe the event helps all participants."

FIRST AID

The first aid scenario was lucky enough to have two event managers — Andrew Chandler and Sue Steele. The scenario, which was based around a split rim tyre that had ruptured, involved five casualties.

EMERGENCY RESPONSE COMPETITION

TYC Curtis Jones

Sue, who is also responsible for applying make-up on casualties, said setting up the scenario was quite simple but there was a lot to do in the lead up to the event.

"The scenario involves about two months of preparation involving things such as tracking down a location, organising props like tents and cars, and creating the actual incident," she said.

"I'm also responsible for applying make-up on the casualties, which takes 45 minutes to put on and then about 15 minutes to touch it up throughout the day."

Sue, who has been doing make-up for the competition for nearly nine years, was previously a competitor. She said that once you get the emergency response bug, you've got the bug!

"It's a feel-good kind of bug, a natural high, where you just don't want to miss a competition," she said.

"We give teams an experience they don't really get on mine site unless they face an accident or tragedy."

First aid, which was only a component of other scenarios in the past, has now been separated into its own scenario, while still remaining a key area of other scenarios.

"They created this scenario because one of the biggest elements to rescue is first aid. It's a huge part as there is always a casualty if you're doing a rescue," she said.

"You can be great at climbing ropes to help someone but if you can't actually save them when you get there, then what's the point of being there."

ROPE RESCUE

Two event managers, Scott Franklin and Kurt Vosselbelt, were the creative minds behind testing who really knew the ropes in this year's competition.

The rope rescue scenario, which required teams to successfully rescue a casualty from drowning inside a water tank, was themed around urgency.

"The idea behind the scenario was urgency and we thought this needed a visual parameter," Kurt said. "We organised for water to be running in the background, and it's rising so there is something real happening, which adds to the urgency of the situation, ensuring the teams work hard.

"Captain leadership was important in this scenario — so you can direct your team to complete everything the captain needs done — and first aid is critical too."

Kurt and Scott said they started organising the scenario three months ago, with the set-up taking about a day and a half.

TEAM SKILLS

Working as a team is a key element to a successful emergency response team so the team skills scenario is certainly relevant. Nicole Syriotis took on this scenario in her first appointment as an event manager.

A nurse by trade, the Emergency Response Coordinator at BHP Billiton's Kalgoorlie Nickel Smelter said she became involved in the competition after attending a Chamber of Minerals and Energy meeting.

TYC Craig Stonham

"I was asked at the meeting if I would like to participate, and the answer was of course I would like to participate in an event like this," she said.

"The team skills event is predominately about testing the captain and the rest of team, while at the same being both challenging and fun.

"I worked alongside other onsite emergency response coordinators to come up with ideas for the scenario, which incorporated challenges, team work, communications and disciplines. Key skills we wanted to test in this scenario were rope disciplines and hazardous chemicals, as well as communications skills."

Nicole said that there was very little set-up and pack-up associated with the scenario but, prior to the event, the activities were practised to ensure they were achievable in the allocated time.

"We practised for about four weeks and ran numerous people through the activities so that we could prepare ourselves for questions that might arise from teams on the day," she said.

"There is a team of about eight on this scenario and, as the event manager, I picked the team, which met and practised weekly for seven weeks before the event."

Nicole said safety is the most important value at BHP Billiton and there were many benefits for competing teams with this scenario, including enhanced emergency response skills and teamwork, particularly in the areas of safety and communications.

CONFINED SPACE

A casualty trapped inside a tank with a "sewage" combination of baked beans, chicken noodles and tomato sauce was just one of the interesting elements in this year's confined space scenario.

The objective of the scenario — rescue a casualty from a sewerage tank and safely decontaminate him from a biohazard. The brains behind the idea of the scenario belong to event manager Tobias Byrne.

"This is the third confined space event we have been involved in, and each year we try and improve the skills base and knowledge of teams by making it more complex than for the previous year," Tobias said.

"Last year, teams were only required to rescue a casualty trapped in a confined space using a rescue plan. This year they had to plan the entry and manage the access with a rescue capability, and then decontaminate after entry.

"It's more technically challenging in 2009 — teams needed to use more skills sets and refer to procedures. The scenario is testing the team knowledge of confined space due process, ensuring legislative compliance to the Mines Safety and Inspection Act and applicable Australian Standards, as well as incident scene preservation and incident reporting."

Tobias said that a lot of planning had gone into developing and creating the scenario, which included sourcing equipment like the tank, rescue equipment, props and scaffolding.


TYC Kelly Bodman

VEHICLE EXTRICATION PLACES FIRST

It is dark, the rain is pelting down and the wind is howling. A car, with three people inside, has driven into an electric power pole. Your emergency response team has been called out to the scene. What do you do?

This is what teams were faced with in this year's vehicle extrication scenario. This creative, challenging and realistic scenario certainly impressed the teams, the crowd and the judges, being voted best scenario in this year's Surface Mine Emergency Response Competition.

The clever and creative mind behind the concept was event manager Kelly Bodman. The Riklan Emergency Management Services employee was volunteered for the role by his boss, who attended a Chamber of Minerals and Energy meeting.

In his first time ever as an event manager, Kelly certainly left an unbeatable mark on this year's competition. Kelly said he was a bit shocked and surprised when he heard of the news but knew it would be a great scenario.

"I tried to make it a fairly easy scenario but with lots of hazards, so the teams would have to come in and be good at hazard identification," he said.

"Once I got my thoughts together, I pulled out old score sheets to figure out how I would write up the scenario because there is quite a lot that goes into making sure the scenario covers certain safety elements and can be scored correctly.

"Once the scenario was approved, the hard work came with getting it organised, and I spent about two months preparing for the event. I wanted to create the scenario in a wholly night time environment as a lot of teams don't get to train at night or have a night time influence to go with their training. I wanted to make sure teams were prepared if something happened at night as it's dark 12 hours of the day for six months of the year, so it could very well be dark when something happens.

"Other hazards that came with the darkness included dealing with shadows and teams having to set-up lighting. A lot of mines rescue teams also may not train in the rain because their gear gets dirty, so rain was the other hazard."

Kelly spent from 7 am to 9.30 pm setting up the scenario, which included making sure the shed in which the scenario took place was in total darkness.

"I lit sparklers to create the effects of a live power line, downloaded music for thunderstorm sounds and set up fans to create the wind," he said.

"I also needed to organise replacing the car in the scenario with a new one each time a team cut through the car to rescue casualties. A loader would come in at the end of each scenario, grab the car, get a new one and place it in the scene, ensuring each scenario was exactly the same for each team."

Speaking on the last day of the competition, Kelly said that he had really enjoyed the role as event manager. It had been a lot of work and he would sleep well after it was all over.

The vehicle extrication scenario was also very well received by competitors, with many teams describing it as their favourite scenario of the competition.

Telfer Gold Mine team captain, Suren Pillay, said that for him and his team, the vehicle extrication scenario was the best one.

"It was hard to top the scenario as it had a very realistic look about it and could very well happen on a mine site," Suren said. "Mines are surrounded by power lines and the chances of someone hitting a pole when driving around doing their job on the site is quite high, especially if a person doesn't drive according to the road conditions, falls asleep at the wheel or loses concentration.

"The best part of the scenario was that it was based at night time and it was raining. It certainly took our team by surprise and it was very different working in darkness. Normally you know where your equipment is but having to look for it and set it up in the dark was harder."

Suren said it was a credit to Kelly, who he described as the next Spielberg, for coming up with such an awesome scenario.

The scenario was also a favourite with overall winners, Sunrise Dam. The team's Emergency Response Officer, Richard Crawford, said it was the most ingenious and challenging scenario the team had ever faced.

"We thought the skills, process and practices we learned in this scenario will help us save lives," he said.

Richard said that it was hard to pick the team's favourite scenario but the short list included vehicle extrication, confined space and fire fighting.

TYC Sunrise Dam

TYC Michael Nugus

SUNRISE DAM RISES TO THE TOP AGAIN

Rising to the top of this year's Surface Mine Emergency Response Competition, to be crowned the best overall team, was the Sunrise Dam Emergency Response Team from AngloGold Ashanti Australia. The 2008 underground and surface competition winners could not be beaten in the first competition of 2009.

Sunrise Dam's team captain, Michael Nugus, also showcased his leading talent, being crowned the competition's best captain for the third year in a row.

Sunrise Dam's Emergency Response Officer, Richard Crawford, said that the team's outstanding results reflected their dedication, hard work and many hours of study.

"It is evident that the cornerstone of the team, and its success, is focused around team captain Michael Nugus, who has such an infectious dedication for mines rescue," he said.

"Witnessing Michael in training and competition mode, he displays his skills at a maximum level, with alertness and the sense of urgency, as well as overall care and response to personnel and property.

"It is also evident that each team member has a multitude of skills that the captain can utilise at any time, and these skills, when applied in training and the competition, are a vital key to any team's successful performance.

"Overall, the underground and surface competitions have been fantastic opportunities to gauge any team's performance in mines rescue."

Sunrise Dam, which has been competing in the mines rescue competition for the past six years, also finished first in the team skills, confined space and team safety categories.

Richard said the fire fighting and vehicle extrication scenarios showcased the diversity appearing in scenarios each year.

"This year's vehicle extrication scenario was probably the most ingenious and challenging scenario we have ever faced," he said. "It was hard to pick our favourite scenario but the top three would be confined space, fire fighting and vehicle extrication, with team skills being the most fun."

Richard said the success achieved by Sunrise Dam was a result of the team's preparation and well structured programs.

"Training is available every Thursday, with specific competition training commencing up to a fortnight before the competition. This type of training receives full support from senior management and allows team members to focus on their specific roles within the team," he said.

Overall, the 2008 and 2009 surface competitions have turned out very promising for Sunrise Dam Gold Mine.

"I'm confident that the competition has built a solid foundation in mines rescue for both the current Sunrise Dam team and our next generation of rescue personnel," Richard said.

The 2009 Sunrise Dam team comprised:

- Michael Erickson (Team Manager)
- Michael Nugus (Team Captain)
- Richard Crawford
- Alex Smadu
- Martin Usher
- Matt Jones
- Kevin Darch
- Masoud Heydari (Reserve)
- Mark Cook (Reserve)

TYC Agnew Gold

TOP TEAMS TO SURFACE IN 2009

Just behind the 2009 overall surface mine competition winner, Sunrise Dam, were three other outstanding performing teams. Telfer Mine Rescue from Newcrest Mining Limited, Yilgarn Team Two from Barrick Australia, and Agnew Gold Mine from Goldfields Australia successfully scooped up a number of the competition's award categories.

Yilgarn Team Two, which placed third overall, won the theory and the vehicle extrication categories. The team's captain, Peter Appel, also took out best new captain and individual theory categories.

Peter said that the team had put a lot of effort and energy into training a couple of days before the competition, which seemed to have paid off.

"For me, personally, it was good to win the individual theory because I put a lot of time into going through training manuals and old exams, then to come in as best new captain as well as second best captain overall, was like — wow, I must have done something right," he said. "Then again, a captain is only as good as his team, so much of the credit for winning these categories also goes to the other team members."

The Yilgarn Team Two, which regularly trains once to twice a month, spent five dedicated training days preparing for the competition. Peter said his team trained alongside Yilgarn Team One at one of Barrick's mine sites, going through several of the scenario categories.

"We had two fantastic trainers, Ben Ingham and Jeff Donovan, who pinned us down on everything we did wrong or where we should improve, and I can't thank them enough for their input," he said.

"In the evenings we went through theory questions and micro skill sessions to improve our general knowledge on mines rescue. Judging from our overall performance, I think that week certainly was well spent and worth all the pain and effort."

Peter said the main benefit of participating in the competition

was that it incorporated some of the best training you can get.

"This is one of the few opportunities that mines rescue teams have to deal with such realistic and full-on scenarios," he said. "Also, our training prior to the competition adds to this overall experience.

"Attending competitions is therefore probably the most efficient way to prepare mines rescue personnel for any real emergencies. It is also an excellent opportunity to meet people from other rescue teams and exchange experiences."

Peter said the team would definitely like to participate again next year as it provided some of the best training you can get — you have to push yourself, learn new skills and improve on the ones you already have.

Proving they really are a golden team was Agnew Gold Mine, who also took out a number of award categories at the competition. The team, based at Leinster, finished on top in the fire fighting, first aid and overall breathing apparatus skills categories.

Team Coordinator, Darren Varcoe, said the team members felt a sense of achievement and were proud to represent their company when trophies were brought back onsite. As a past participant, he thought that the competition overall appears to be getting better and better.

"The introduction of new teams and new team members, as well as catching up with old friends, makes it an enjoyable weekend for all," he said.

"Some of the scenarios were very realistic and created the sense of urgency you come to expect from a real life incident.

"I really enjoyed the fire fighting scenario, especially when they cranked up the flames making it very tough for teams to put out. It was a realistic representation of a plane crashing into a vehicle at the end of a runway, and you could easily picture in real life how this could happen."

Darren said that with Leinster being a fly-in fly-out operation, there was not a lot of training time due to team members being on different rosters, which made it hard to get the team together at one time.

"Basically, we are relying on what the team has learnt throughout the years in their regular training," he said. "We do train from the Monday to the Thursday the week before the competition, to get all members working as a team so they are aware of what their role is within the team."

Darren, who has now been involved in the competition for the last 14 years, said he would continue to support these events for as long as participants were willing to compete.

"There are many benefits for teams that are involved in these competitions as they can develop team work and camaraderie skills. You also make a lot of mates during the event that you are then able to share ideas and other learnings with.

"The teams learn a great deal from scenarios that have been created by trainers and senior occupational health and safety specialists who have been in the industry for a long time.

"The extra training team members get out of these competitions gives them an edge over other volunteers who don't compete."

Another of Western Australia's golden teams, Newcrest Telfer Gold Mine, also showcased their outstanding skills by being awarded the best new team and winning the overall first aid category. It was a Telfer team's first win at the competition since 1995.

Telfer team captain, Suren Pillay, said a lot of hard work and preparation went into training and getting ready for the competition, making the win worthwhile.

"It was great to see the support that we received from Newcrest and the General Manager of Telfer, Mark Mitchell, who were just as proud as we were."

The team, located at a site 350 kilometres inland from Port Hedland, conducts emergency response training once a month. Suren said that team members also trained together for the week immediately before the competition.

"In the week's training, we went through the scenarios that we knew we were going to face in the competition," he said.

"We started at 6 am and finished at 6 pm, then studied at night as a group. We were exhausted by the end of it but it was well worth it. It was also a great opportunity for the guys on the team to bond and get to know each other."

Suren said working as a team, trust, focus and remaining calm were some of the key factors that led to the team's success.

"The whole idea of being in a team is to try and work together to achieve the best result," he said.

"Everyone comes from different backgrounds and has individual beliefs, but you have to put that aside if you are going to perform well as a team and win categories such as best new team and overall first aid.

"Each individual on the team is there because they bring something different to the table, and they all performed exceptionally well when they needed to.

"I personally learnt to be patient and to make calculated decisions based on the situation as it is very easy to lose concentration when there is an emergency. There are numerous things going on, so to stay calm takes a bit of practice. However, it does make it easier when you can trust your team and have full confidence in team members to carry out the tasks assigned to them."

Suren said that, given the chance, the team from Telfer would definitely compete again next year.

"The competition brings out the best in everyone, and there is a lot to learn from other teams to see how things are done differently on other mine sites," he said. "There is more than one method when attempting a rescue, so to see a team attempting other ways is quite interesting and very valuable.

"The Telfer team has the taste of it now and we want to test ourselves further and see how far we can't get — this is only the start!"

NEW COMPETITORS TAKE ON EMERGENCY RESPONSE CHALLENGE

This year's Surface Mine Emergency Response Competition saw the participation of four new teams — one of the teams even travelled from New South Wales to be part of the event.

Western Australian-based teams Premier Coal, Avoca Resources and Newmont Boddington Operations, together with NSW-based team Barrick Cowal Gold Mine, were the new competitors for 2009. There were 15 teams in total.

The new teams said that they were extremely happy to be part of the 2009 competition and welcomed the unique and invaluable experience.

During the competition, Avoca Resources team captain, Justin Maher, said that the competition was proving challenging but that his team was prepared.

"None of us have ever done this competition before but the team is working so cohesively," he said. "We had a week of training prior to the event and the team is performing magnificently.

"Every scenario we go to, we are being told we are doing excellent and asked how many competitions we have been in, and we explain that this is actually our first."

At the time, Justin said that the highlight of the competition so far had been the vehicle extrication scenario because of how challenging and realistic it was.

"The scenario was very well presented and very realistic, and you had to step back and remind yourself that it is not real," he said. "The scenario had wind, rain and darkness to present a winter, night time effect. The presentation, and the way it all came together, was very well planned and structured."

Justin said the competition was definitely something the team would get involved in again.

"The competition is such a vital side of the mining industry in regards to safety," he said. The experience is priceless and we are learning from other teams and through our own experience in the competition. The learning curve has been very steep."

Travelling all the way from the State's South West to join the competition for the first time was Collie-based team, Premier Coal. Premier Coal team member, Alan Fontana, said they only had five of six team members competing, with one of the members becoming sick with a migraine on the road trip to Kalgoorlie. They had overcome the challenge by working harder as a team and pulling together.

"From day one, we have had to compete with one less in our team," he said furing the competition. "The adjudicators do know of the situation but, yes, it has been more of a challenge for the five of us."

TYC Premier Coal

Members of the team, which normally competes in the South West Emergency Response Competition, said they had always known about the Kalgoorlie-based event and had been looking for an opportunity to get into the competition.

"The Chamber of Minerals and Energy contacted us to say there was a space in this year's competition," Alan said.

"We normally compete in the South West one but it didn't run this year, so we thought we would try our luck at this one. Compared to the South West competition, this one is a lot harder, better organised and the scenarios are more in depth. The scenarios have been really good and very life like."

In preparing for the event, Alan said the team normally trains each month but, in the lead up to the competition, had trained for longer.

"We completed a solid five days of additional training to ensure we were well prepared for the competition and our skills were up," he said. "In our training we work out those areas in which the team is deficient and needs more skills, and then we concentrate on them in training sessions."

Alan said the reason that Premier Coal had joined the competition was to improve skills."You can train as much as you want but you can't beat a competition like this," he said. "There are also huge benefits in participating in a competition other than the one we usually compete in. You can pick up a few good things from being in a competition for the first few years but then you get familiar with the types of scenarios and the routine, and it's not as beneficial in terms of learning new skills."

Also travelling from south of Perth and the world of gold was new competitor, Newmont Boddington Operations. The team also had the opportunity to join the event after the South West-based competition was cancelled.

Newmont Boddington Operations Coordinator, Brian Howarth, said a combination of formal training courses with internal training had prepared the team for the challenging event.

"We have a set training schedule we work against and we ensure training is consistent throughout all our teams," he said.

"The team had a couple of training days in the last week, but effectively that's been about it as we are in the middle of a commissioning and start-up phase, so we couldn't devote a large amount of resources to training for the competition.

"The benefits for us competing in this competition are that (a) our team gets to interact with other teams; (b) we can evaluate our team, our training system and the team's performance against the industry standards; and (c) it's a reward mechanism for our guys."

Speaking immediately after completing the fire fighting scenario, Newmont Boddington Operations team member Rhett Ebsary said the scenario was beyond his imagination.

"It put me on my guard straight up but I like a challenge so it was good," he said. "A plane that had crashed into a vehicle with multiple casualties was not anything I imagined we would have to deal with.

"As a new team to this competition, we are getting more out of this than you would ever get out of training because it's so close to real life. We will be back next year."

Travelling all the way from New South Wales was the final new competitor to the 2009 competition, Barrick Cowal Gold Mine.

Barrick Cowal joined three other Barrick teams, all based in Western Australia — Barrick Kanowna and two teams from Barrick Yilgarn.

Speaking the night before the competition, Barrick Cowal team captain Shane Hansen said that this was the first year his team had competed in Western Australia.

"This is the first time these particular team members have been pulled together for a competition,"he said. "It's been a good solid week of training. We sort of set one day of training aside for one type of scenario. For example, one day was dedicated to hazardous chemicals, one for confined space and so on.

"We have been sent to Western Australia to learn from the teams over here and, hopefully, to be competitive, especially with the WA-based Barrick teams.

"I have so much faith in the team, they know their jobs, they do them well and I think we are going to do alright."

TYC Boddington

NEW NSW TEAM KNOWS THE ROPES

The first News South Wales team ever to join Goldfields-based Surface Mine Emergency Response Competition, Barrick Cowal Gold Mine, certainly showed it could handle the ropes in Western Australia.

The team members, who were competing together for the first time, were crowned the winners of this year's rope rescue category. Successfully rescuing a casualty from drowning inside a water tank using emergency response rope rescue techniques, the Barrick Cowal team exhibited great knowledge and strong skills when it came to rope rescue.

After receiving the award, team captain Shane Hansen said it was a very rewarding experience.

"We all trained hard and dedicated a lot of time to this competition and, while the primary focus was on learning and honing our skills for the benefit of our work mates, it is very gratifying to come away with a trophy," he said.

"While management endorses the primary reason to attend this competition is to learn, bringing a trophy home can sometimes help win support to attend the next competition."

Shane said that the key skill the team used in the rope rescue scenario was teamwork.

"Teamwork is always a requirement at these events, and I was very happy with how well the team jelled," he said.

"As the rope rescue scenario adjudicators told us prior to the event, rope rescue skills were the primary requirement for the rope rescue scenario. I believe the effective and safe rope system we utilised during the scenario was what helped us win on the day."

There were five adjudicators and two event managers who provided feedback to teams on different emergency response elements after completing the scenario.

Shane said that the team from Barrick Cowal had a great time at the competition and members felt their skills as rescue personnel had greatly benefited.

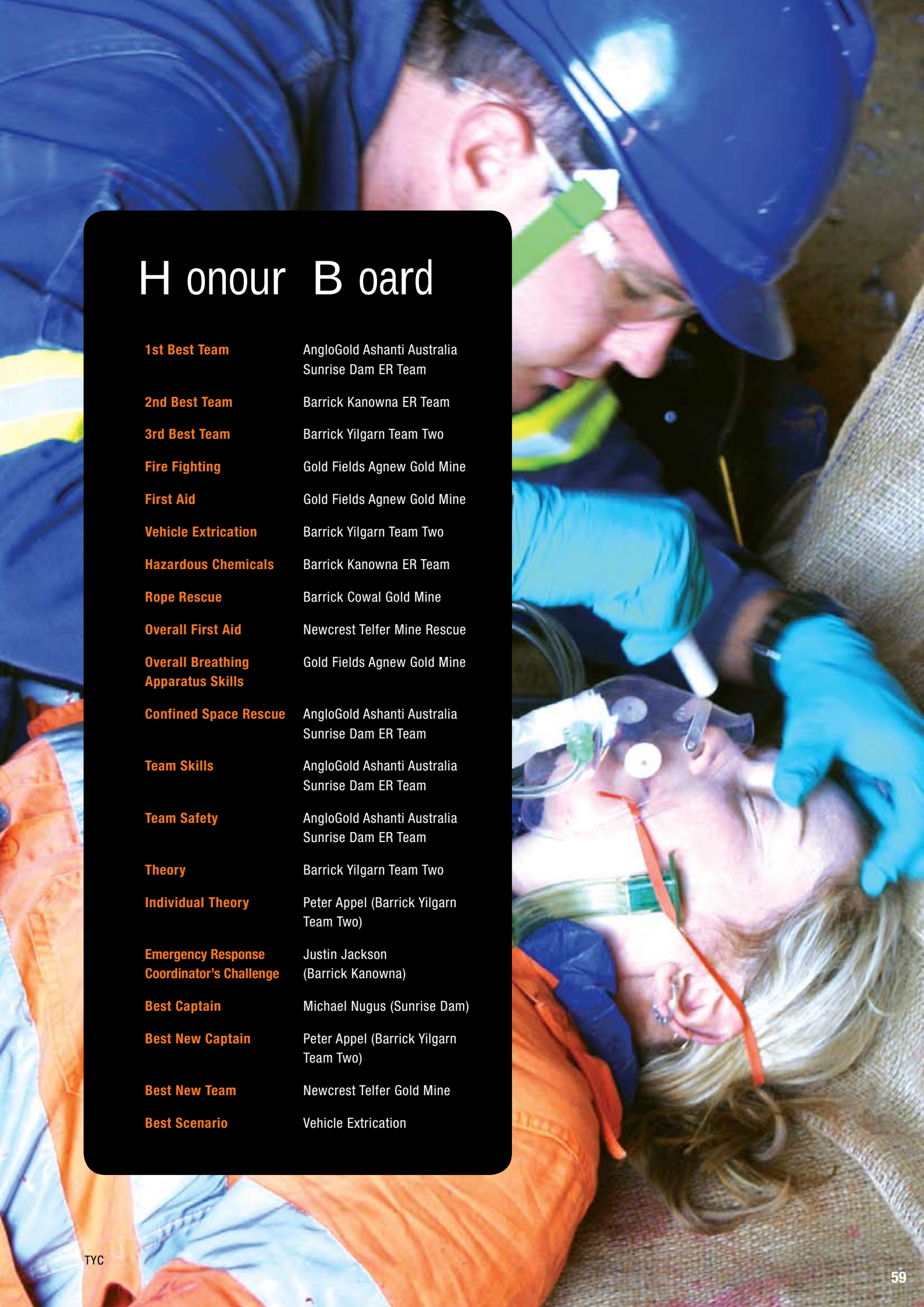
"Our skills benefited not only from our own training and preparation, but also from what we learnt from the managers, adjudicators and other teams," he said.

"Nothing is as effective at improving your emergency response skills as attending a real situation. However, the realistic scenarios presented at this competition that force us to work under pressure are the next best thing.

"We are planning to return to the competition next year, but this is ultimately decided by the event organisers."

The Cowal gold mine is located about 350 kilometres west of Sydney.

TYC Barrick Cowal

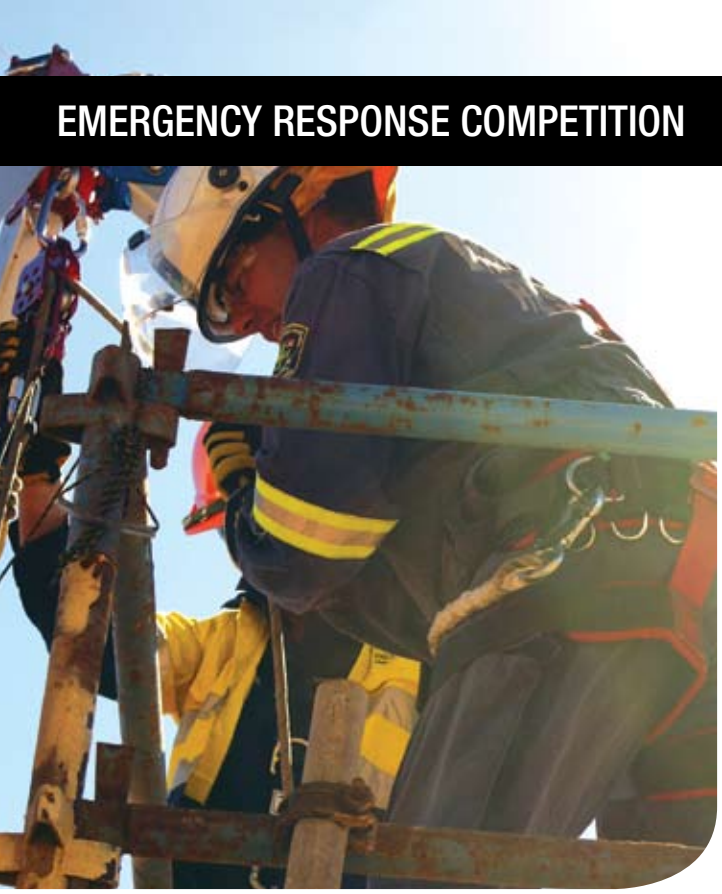


H onour B oard

1st Best Team	AngloGold Ashanti Australia Sunrise Dam ER Team
2nd Best Team	Barrick Kanowna ER Team
3rd Best Team	Barrick Yilgarn Team Two
Fire Fighting	Gold Fields Agnew Gold Mine
First Aid	Gold Fields Agnew Gold Mine
Vehicle Extrication	Barrick Yilgarn Team Two
Hazardous Chemicals	Barrick Kanowna ER Team
Rope Rescue	Barrick Cowal Gold Mine
Overall First Aid	Newcrest Telfer Mine Rescue
Overall Breathing Apparatus Skills	Gold Fields Agnew Gold Mine
Confined Space Rescue	AngloGold Ashanti Australia Sunrise Dam ER Team
Team Skills	AngloGold Ashanti Australia Sunrise Dam ER Team
Team Safety	AngloGold Ashanti Australia Sunrise Dam ER Team
Theory	Barrick Yilgarn Team Two
Individual Theory	Peter Appel (Barrick Yilgarn Team Two)
Emergency Response Coordinator's Challenge	Justin Jackson (Barrick Kanowna)
Best Captain	Michael Nugus (Sunrise Dam)
Best New Captain	Peter Appel (Barrick Yilgarn Team Two)
Best New Team	Newcrest Telfer Gold Mine
Best Scenario	Vehicle Extrication

TYC

EMERGENCY RESPONSE COMPETITION



All photos TYC

COMPETITION TEAMS

Agnew Gold
Avoca Resources
Barrick Cowal Gold
Barrick Kanowa
BHP Billiton Leinster Nickel Operation
Boddington Gold Mine
Diorio-La Mancha Joint Venture
Goldfields St Ives
Kalgoorlie Consolidated Gold Mine
Murrin Murrin
Premier Coal
Sunrise Dam Gold Mine
Telfer Gold Mine
Yilgarn One
Yilgarn Two

Photo courtesy Matt Bellamy

STUDENTS VENTURE INTO RESOURCES SAFETY

From 5 to 17 July this year, 13 of the State's brightest high school students interested in mining-related careers participated in the 13th Australian Student Mineral Venture (ASMV) held in Western Australia following a one-year hiatus.

The first 11 Ventures were run by geologist Dr Susan Ho, now Communications Manager with Resources Safety. Elaine Miles, 2009 ASMV Co-administrator with Matt Bellamy, was one of the 300 or so ASMVers mentored by Dr Ho and her teams of "chaperones". Elaine's team this year included two more ex-ASMVers, and the 12th Venture was also run by an ex-ASMVer.

The 13-day program, an initiative of The Australasian Institute of Mining and Metallurgy (The AusIMM) Education Endowment Fund, aims to attract more students to professional mining careers.

"Students have the chance to see the careers available to them and visit a variety of operations in the South West and Goldfields so that, once they have been through university and completed their studies, they have an idea of what it will actually be like on-site," Elaine said during the 2009 group's visit to Resources Safety.

"They also visit universities and complete some practicals and laboratory activities, as well as meet some of the lecturers and see the campuses.

"We are also talking to some of The AusIMM student chapters, so that participants can get a better idea of what it's like to be a uni student."

Elaine said that the 13 participants were a mix of boys and girls from Year 10 to 12 and from metropolitan and regional areas, including seven students from Perth, Geraldton, Tom Price, Badgingarra, Manjimup, Narrogin and Bunbury.

"The optimal age to join the program is in Year 10, before they pick their TEE subjects, but a lot of students at that age are still a bit young and some have not reached the stage of caring or thinking about what they want to do. Many students on this year's program are in Year 11 or 12," she said.

"When I was at high school, I attended the ASMV. I was certain that I wanted to be an engineer like my dad, but he was a civil engineer and by the time I finished the ASMV, I knew I was going to be a mining engineer," she said.

The ASMV is an annual program. Applicants are required to send in a letter stating why they want to come on the program and a reference from a teacher, and demonstrate good grades and performance in science and mathematics competitions. Typically, about 30 students are selected to participate but Elaine said that numbers were affected this year by the economic downturn, although people had still been receptive to

the program and it has a good reputation.

"At the time of this year's applications, a few mines were closing down and it was very hard to get students to apply for something when there was negative publicity about mines closing and people losing their jobs," she said.

"In spite of these conditions, industry has been really supportive of the program. The companies willing to host us on visits recognise that the resources industry is cyclical and can appreciate that, once these students have gone through university and are ready to enter the workforce, the skills shortage could be worse. They are thinking ahead."

MineSafe spoke to some of the students when they visited Resources Safety. Danielle Cream, a Nagle Catholic College student from Geraldton, said that, after two years of trying to get into the program, she was really happy to be involved in 2009.

"I applied when I was in Year 10 and was on the waiting list but didn't get in. Then last year's ASMV was cancelled so I was really happy to get in this year — it was worth the wait," Danielle said.

"I applied to see what I wanted to do in the future, to see if working in the minerals industry was really for me or not. It's helped me to decide that I want to do geology, but also helped me recognise I want to do a double degree in geographic information science.

"The program has been really fun so far. We have been visiting all the universities and seeing if we want to go that uni. I'm really looking forward to visiting Kalgoorlie as it's where I want to end up getting a job."

Year 11 student Reagan Manns from Scotch College in Claremont said he also got involved in the program to get an idea of what he wanted to do.

"I want to do some form of engineering, maybe metallurgy, and I hope this program will make my decision more correct and push me in the right direction," he said.

"It was great going to Murdoch University and doing some experiments with metallurgy. At high school you do chemistry but you don't do applied chemistry where you get to separate copper, dilute it and work out the strength of the copper, so doing those sorts of experiments at Murdoch was pretty cool.

Reagan said the program was a great way to meet new people and make some valuable contacts in the resources industry.

"The after-dinner networking events are especially good as you get to meet guest speakers who talk to you about the mining industry", he said. "You also get contacts and email addresses so when you are eventually ready to enter the field, you have a wide range of people that you can contact."

ELAINE'S DIARY, LUCKY 13

13th ASMV, 13 days, 13 lucky students!

me (Elaine)

DAY 1

Welcome: Afternoon tea with parents

Official opening: Chris Davis, president of The AusIMM Perth Branch, entertaining after-dinner talk

DAY 2

The University of Western Australia: Pit optimisation at mining engineering, rock properties at geology

Evening: Members of Australian Institute of Geoscientists talked about geological pathways they had followed

DAY 3

Department of Mines and Petroleum (DMP), Geological Survey of WA: map production, importance of mining in everyday life

Murdoch University: Hydrometallurgy, pyrometallurgy and mineral processing laboratories

Dinner: Hosted by The AusIMM Murdoch Student Chapter

DAY 4

Komatsu's Welshpool facility: Comprehensive tour and presentation on maintenance planning

DMP, Resources Safety: Mines safety and health management, tips for an incident-free ASMV!

Evening: Ten-pin bowling

DAY 5

Curtin University of Technology, Bentley: Exploration geophysics – ground-probing radar, applied geology – more rocks!

Lunch: Hosted by The AusIMM Curtin Student Chapter

CSIRO, Australian Resources Research Centre (ARRC): Tours and presentations including rock mechanics, scanning electron microscope and gold collection

Simon Ridge

Resources Safety visit

DAY 6

Boddington bauxite mine: Early morning start! Presentations on Worsley, mining practices, environmental work, and vacation and graduate programs followed by pit tours

Worsley refinery (after a scenic detour): Tour including control room, which was amazing

Accommodation: Mornington for the next three nights – welcome to the freezing cold!

matt took these photos

DAY 7

Griffin Coal: Pit tour, amazed by size and trucks

.....

Collie Visitor's Centre: Underground tour through the history of coal mining

.....

Accommodation: Huddled for warmth in the dining room, quiz night

DAY 8

Team building exercises: Lots of fun and challenges on low ropes course at Mornington

.....

Simcoa silicon smelter: Walked across furnace floor and saw pot of molten silica being poured into bars

DAY 9

Big (travel) day out: Trekked across the State from Collie to Kalgoorlie. Everyone was glad when we finally arrived at the Goldfields Camp School!

DAY 10

WA School of Mines: Resource estimation laboratory then brief sojourn to Superpit lookout to see blast (alas, it was cancelled at last minute) followed by metallurgy

.....

Kalgoorlie tours: Museum of the Goldfield and Agricola College, where we stayed for dinner

DAY 11

Superpit: Tour to a lookout on first level provided another perspective of the magnitude of the pit, presentations on geology, processing and the environment

.....

Mining Hall of Fame: Underground tour and gold panning

.....

Evening: series of blasting videos to entice budding mining engineers and talk from a recently graduated metallurgist

DAY 12

Kambalda: Otter Juan nickel mine – we went underground at an operating mine! Then pit and mill tours at St Ives gold mine – a great day

.....

Presentation dinner: Camp School, we all lasted to the end!

DAY 13

Time to go home then back to school or work, as the case may be :(Elaine

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **153**

TRUCK DRIVER FELL FROM DECK OF CATERPILLAR 777D HAUL TRUCK – FATAL ACCIDENT

21 MAY 2009

Incident

During normal haul truck operations at an open pit mine, a female operator was found on the ground at a location directly below the access ladder to the driver's deck of a Caterpillar 777D haul truck.

The truck was stationary in a designated park-up area at the time of the accident.

The work area on the deck was clear of obstructions.

The operator subsequently died in hospital the following day.

Although there was no direct witness to the accident, the circumstances revealed by the investigation indicate that the operator fell from the deck while cleaning the windscreen of the truck.

Immediate causes and contributory factors

- The deck plates on the driver's platform in front of the windscreen did not extend the full width of the cabin.
- The top rung of the access ladder was located below the level of the deck.
- The arrangement of the deck plates and ladder access create an open area over the ladder stairwell.
- An employee could inadvertently step into this area and fall directly to the ground.
- The handrails on the standard Caterpillar deck do not extend the full length of the windscreen and ladder access.
- A flexible safety chain was positioned across the grab rails from left to right across the access stairwell.
- One of the methods used by employees to clean the windscreen was to straddle the stairwell void with a leg on each side of the ladder.
- In this position the safety chain could form a pivot point for an employee to tip backwards and fall to the ground.
- There was no written procedure for cleaning the windscreens on the Caterpillar 777D haul truck.
- The other trucks in the mining fleet were Caterpillar 789 and 793 haul trucks, which have an enclosed walkway around the driver's cabin and an inclined stairway for access to the trucks.

Design factors identified from the investigation

- The Caterpillar 777 range of haul trucks has been used around the world for several decades.
- The older A, B, C and D series of trucks have similar driver access arrangements to the truck involved in the fatal accident.

- Design variations to the driver's deck layout, the step arrangement and the positioning of guard rails were noted in follow-up observations at a number of mine sites.
- The general layout of the ladder access to the deck plates creates an open area that presents a risk of a fall to persons working or moving in front of the windscreen of the driver's cabin.
- The latest truck in the series, the Caterpillar 777F, has undergone a significant redesign that includes an angled stairway instead of a steeply inclined ladder. Handrails are also provided on the full length of the stairway to the driver's cabin.
- Other observations show that a number of older Caterpillar 777 models have been modified with inclined stairways mounted to the front of the truck.
- This type of modification appears to be useful when trucks are used in ancillary roles such as on run-of-mine (ROM) pads and as water carts.
- Two Australian Standards provide guidance for truck access systems, ladders, stairways, elevated platforms and handrails:
  - AS 3868:1991 *Earth moving machinery – Design guide for access systems;* and
  - AS 1657:1992 *Fixed platforms, walkways, stairways and ladders – Design, construction and installation.*
- A consultant's report was commissioned to review ergonomic and safety factors relevant to the cabin access and work arrangements on the truck involved in the accident. The review made suggestions that could significantly reduce the risk of a fall from the cabin deck.

Comments and preventative actions

- All mine operators using the early series of Caterpillar 777 haul trucks should urgently review all the tasks involved in truck operator access and work from the decks around the driver's cabin.
- Safe work practices should be developed for all tasks that pose the risk of a fall from a height.
- These procedures should involve maintaining three-point contact on ladder ways and working decks.
- Employees should be trained in any changes to existing procedures.
- The access ladder, deck arrangement and handrail provisions should be assessed and modified in conjunction with the original equipment manufacturer (OEM) using Australian Standards AS 3968 and AS 1657 for guidance.
- Where practicable, consider replacing older plant models with later models employing the most up-to-date safety measures. Also consider the employer's legal position when an OEM has modified equipment provided for the safety of operators and others.
- A continuous deck with proper handrails should be provided around the cabin.

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **154**

HEAVY WIRE LIFTING SLINGS FELL FROM CRANE HOOK – EMPLOYEES INJURED

7 JULY 2009

Incident

A crawler-type crane rated at 450 tonnes safe working load (SWL) was being used to position a 1 tonne head chute cover on a conveyor located 45 m above ground level. The crane operator did not have a clear view of the hook or load, and was being directed by a rigger at the conveyor head end. Two fitters and three trade assistants were working in the vicinity of the lift.

The crane was configured with two heavy duty 5 m x 63 mm wire rope slings (each weighing 278 kg) suspended from the crane hook, and the load was being slung with two-leg chains shackled to one of the wire rope slings.

After a second adjusting lift successfully positioned the load, the rigger directed the crane driver to slowly lower the hook to allow removal of the lifting chains. An instruction from the rigger to stop lowering was not heard by the crane operator. As the crane hook descended, ferrules swaged on the "dead ends" of the rope slings fouled against structural steelwork, causing the eyes of the two slings to push upwards in the hook and against the hook safety catch.

With slack rope accumulating, the hook block (weighing some 3 tonnes) started to "fall over", causing both slings to burst through the safety catch and fall among the work party below. Five employees suffered a range of fractures, lacerations and contusions.

Immediate causes and contributory factors

The accident would not have occurred if the crane had been properly positioned to allowed free movement of the rope, hook

and slings well clear of any obstructions.

The type and configuration of the crane were not ideal for the lift being performed, as described below.

- The crawler crane involved had a torque converter system on the main winch and was not configured for fine work that used the whip line (auxiliary winch) and headache ball.
- Use of the two large wire slings increased the risk of fouling on the structure, whereas additional reach could have been achieved with the use of a single-leg chain sling.
- The lifting crew size was inadequate — a single rigger was performing both the rigging work and directing the crane operator.
- The call from the rigger to stop lowering the hook was not heard by the crane operator (nor the trainee crane operator also in the crane cabin) and indicates poor communications.
- The rigger directing the crane operator did not confirm his communication had been received by the crane driver (e.g. by watching the movement of the hook).

Comments and preventative actions

An increasing incidence of accidents involving the use of cranes on mine sites raises serious concern and supports an urgent need for responsible persons at mine sites to review their current work practices.

Most accidents arise from human factors such as poor judgment and inattention, particularly with some small "lifts" that have been incorrectly categorised as "routine" and not requiring a specifically designed lift procedure or risk assessment.

Australian Standard AS 2550 Set: 2008 *Cranes, hoists and winches – Safe use* provides users with essential guidelines for the design, construction and testing of cranes, hoists and winches.

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **155**

ROCK FALL DURING SUPPORT CYCLE IN A HIGH HEADING DEVELOPMENT – FATAL ACCIDENT

17 JULY 2009

Introduction

A number of safety bulletins and significant incident reports have been issued over the years to address the hazard of rock falls in the development of high headings. This significant incident report follows from another fatal accident when an employee was killed by a rock fall while rock bolts and mesh were being installed in a high heading development drive. The report includes recommendations made by the Coroner following an inquest into the circumstances surrounding the incident.

Incident

A standard high heading development was being advanced with four metre long rounds by drill and blast methods with a twin boom jumbo.

Support specifications using split set rock bolts and weld mesh had been developed and were consistent with accepted geotechnical standards.

The ground conditions in the development area were generally good, but the last round had opened up a small fault zone in the backs and created ground conditions that were "blocky" in appearance.

The jumbo operator was being assisted by a second jumbo operator working as an offsider on the day of the accident. Both operators were regarded as being well trained and experienced employees.

The operator who was offsiding was moving forward with a bolt to place it on the boom of the jumbo when a large rock fell from the back, struck him and pressed him to the ground. He died at the scene.

The evidence from the investigation indicated that the deceased was one or two steps beyond the last row of bolts in a position under unsupported ground when the rock fell.

Immediate causes and contributory factors

- There was a change in the ground conditions with a faulted blocky zone exposed in the backs after the last blast.
- The jumbo operators at this mine normally work on their own but, on this day, another operator was used as an offsider because his jumbo was not available for use.
- The operating procedures referred to not working in unsupported ground but there was a lack of clarity in the definition of what comprised unsupported ground.
- Because of the configuration of the jumbo and the

dimensions of the drive, it was difficult to see with precision if an offsider moved beyond the last row of bolts into the unsupported ground area.

- The presence of loose rocks on the floor of the drive could have caused the offsider to look down to avoid tripping, instead of carefully observing the backs.
- The operator working as an offsider advanced beyond the last row of rock bolts into an unsupported area and was struck and killed by a large rock that fell from the backs.

Comments and preventative actions

- All employees involved in the operation of high heading jumbo development headings must stay under supported ground at all times.
- Employers of persons engaged in high heading development must provide a clear definition of what is regarded as supported ground and unsupported ground.
- Where mesh and bolts are used, the boundary between supported and unsupported ground should not be allowed to extend beyond the last complete row of rock bolts, except for a defined distance from the last row of bolts to the working face when the distance between the face and the last row of bolts is less than the interval between each row of bolts.
- Standards should provide this maximum distance from the last row of bolts to the working face.
- The area between the last row of bolts to the face must be carefully scaled or rattled or both, and procedures should allow for spot bolting in this area if required.
- After the accident, the employers, in consultation with employees, introduced a requirement to place witches hats on the ground to demarcate the boundary between supported and unsupported ground during the operations for installing bolts and weld mesh.
- This practice is recommended from the Coroner's findings and should be applied throughout the State. Where witches hats are considered impractical, an alternative method should be used to demonstrate the unsupported ground boundary at ground level.
- When the jumbo is being positioned, it must be possible to configure the booms so that bolts, plates and drilling tools can be put onto the boom from a location under supported ground.
- Specific procedures should be developed for a workplace where a jumbo operator is working with an offsider. These procedures should clearly define the separate responsibilities of the jumbo operator and the offsider, including the interface of those responsibilities.
- A review of the adequacy of the training and ongoing assessment of jumbo operators, including feedback as regards training and assessment, should be carried out to ensure its effectiveness in keeping the workforce competent and aware of safety requirements.

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **156**

DETONATION OF MISFIRED EXPLOSIVE DURING BOGGING OPERATION

17 JULY 2009

Incident

During waste bogging operations in a development heading at a mine, the loader operator heard a noise that sounded like a detonation of explosives.

Examination of the remaining muck pile at the face did not reveal any explosive material. A further examination of the waste that had already been bogged from the face unearthed two pieces of a cord-based explosive typically used for perimeter blasting in development headings. The detonator cord was of heavy duty construction with a nominal core charge of 70 g/m pentaerythritol tetranitrate (PETN), which can be initiated by significant impact, friction or heat.

Fortunately, no injury resulted from this incident. Detonation of misfired explosives can result in fly rock and potentially serious injury.

Immediate causes and contributory factors

- It was concluded that the loader bucket had contacted a piece of cord detonating that had misfired in the face blast.
- The development face firing was a breakthrough cut into a production area. At this particular mine, these firings are centre primed and the cord product is not usually used. The cord product was used in the perimeter holes on this occasion, it was not fully consumed in the blast and some has ended up as misfired material in the muck pile.

Comments and preventative actions

To avoid a recurrence of this type of incident, the following actions should be implemented.

- Use explosives in accordance with the manufacturer's recommendations to minimise the chance of any misfire or detrimental outcome.
- Ensure that a blast management plan is available and rigorously applied to each specific blasting application (e.g. standard development firing, breakthrough firing).
- Carry out regular reviews and audits of the blasting procedures and practices to make sure that explosives are applied correctly to ensure compliance with site procedures and standards.
- Investigate the occurrence of misfires, determine the cause, and take action to ensure that the potential for misfires is minimised. Consultation or involvement of the explosives manufacturer or supplier may be beneficial to such investigations.
- Misfired explosives can easily be hidden in the muck pile and only exposed during bogging operations. Therefore, it is important that loader operators are trained in:
  - the identification of explosives;
  - the identification of possible misfire locations;
  - the need to remain vigilant during bogging operations for evidence or signs of misfired explosives; and
  - the action to be taken when a misfire is identified or suspected to have occurred.
- This is particularly important in respect of those misfires involving cord type explosives that contain PETN, which is sensitive to impact, friction and heat.

MINES SAFETY BULLETIN NO. **84**

FAILURE OF LIGHT VEHICLE STEERING BOX SHAFT

25 MAY 2009

Introduction

Following a steering box shaft failure on a mine site, an incident investigation report was received by Resources Safety. The root causes of the steering box shaft failure were noted in the investigation.

The incident involved the shearing of a "sector shaft" of a steering box on a Toyota 4WD, resulting in total steering failure and loss of operator control. The sector shaft extends from the steering box with a male spline and is attached to the pitman arm, which is connected to the steering rods, along with the power steering hydraulics.

The investigation found the following.

- Inspection of the failed steering box showed that a worn section of the shaft had been repaired by machining down the shaft and fitting a sleeve. This created a stress point on the shaft that subsequently fractured.
- The shaft failed without warning.
- Thirteen of 38 steering box units checked at the mine site were found to have lathed sector shafts with pressed sleeves installed.
- Of the 13 modified steering box units, two had fatigue failures.

Discussion

Many of these steering boxes are exposed to heavy duty usage on mine sites and other primary industries such as farming.

When a sector shaft is worn or damaged by normal wear and tear, the seal ring cannot maintain the seal and the steering box leaks oil, leading to mechanical failure within the steering box.

Worn or damaged steering boxes may be returned to the distributors to be overhauled, with some being resold to the general public or industry through the secondhand parts market.

To prevent damage to the steering box, it is possible for a worn sector shaft to be lathed down and fitted with a pressed sleeve to maintain the design diameter and create a good seal for the steering box oil. However, the removal of metal from the sector shaft weakens the shaft and decreases its ability to absorb impact from the steering system. This can lead to metal fatigue and component failure, resulting in loss of operator control of the vehicle.

Further investigation by Resources Safety has found that refurbishment of steering box sector shafts for Toyota Land Cruisers has been common practice for some years.

In addition:

- Toyota steering box units have been interchangeable from one vehicle to another since 1990.
- Toyota increased the diameter of the sector shafts on its steering boxes in 2003, so it is likely that there are two types of the steering box on the market.
- It is almost impossible to trace all reconditioned steering boxes to determine their origin or reseller details.

Recommendations

- Toyota steering box units should be inspected and serviced by a qualified technician according to the maintenance schedule given by Toyota.
- Toyota steering box units requiring replacement should be replaced by genuine units or parts.
- Given the possibility that these practices are used on similar components for other vehicles, similar precautions should be considered when maintaining or servicing critical steering linkage components on any vehicle.

MINES SAFETY BULLETIN NO. **85**

MOBILE EQUIPMENT CONTACT WITH HIGH-VOLTAGE OVERHEAD POWERLINES

4 JUNE 2009

Introduction

This safety bulletin is prompted by serious concern regarding the number of incidents involving a variety of mobile plant items inadvertently coming in contact with high-voltage overhead powerlines on Western Australian mines sites.

A review of occurrence reports for the ten-year period from 1998 to 2008 reveals that:

- there have been 74 reported contacts with overhead powerlines;
- on average, eight incidents where heavy machinery has contacted powerlines are reported each year; and
- excavators cause the highest number of powerline contacts (Figure 1)

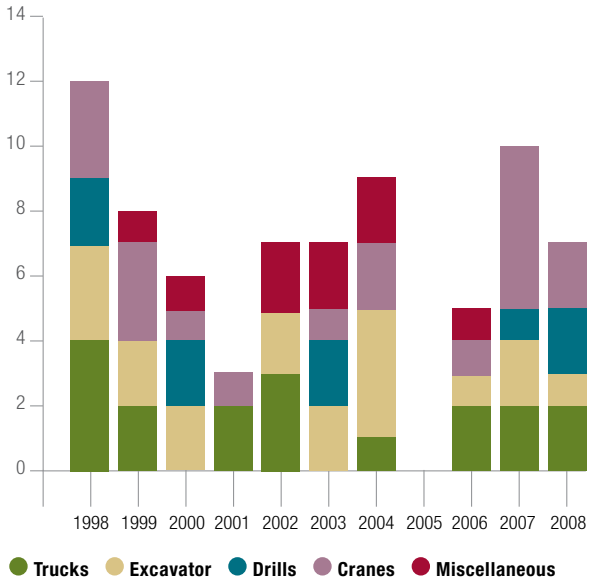


Figure 1 Graph showing number of powerline contacts reported to Resources Safety between 1998 and 2008

In the current year, Resources Safety has already received four incident reports where mobile equipment has contacted powerlines. Only "good fortune" prevented fatal consequences. Others have not been quite so "lucky". In the period 1995 to 2005, about a quarter of all workplace electrocutions (i.e. death caused by electricity) in Western Australia were caused by contact with powerlines.

Previous safety alerts from Resources Safety on this topic

include Mines Safety Bulletins 51 and 56, released in 2001, and Mines Safety Significant Incident Reports 16 (1990) and 46 (1994). So it is timely to issue another reminder to all employers, managers, supervisors, contractors and workers responsible for the use of cranes, excavators, drills, elevating work platforms (EWPs) or similar plant on mine sites.

Contributory factors and consequences

The Mines Safety and Inspection Regulations 1995 — specifically, regulations 5.18(2)(f), and 5.28(1)(c) and (d) — require employers to ensure adequate clearances are maintained when certain activities are carried out using plant with elevating parts near overhead powerlines. Any overhead powerline must be considered energised unless the owner of the line or the electric utility company indicates that it has been de-energised and it is visibly grounded.

The review of occurrence reports from 1998 to 2008 indicates that many operators, their employers, supervisors and contractors who work with or around cranes, drills and excavators were not fully aware of the hazards of operating mobile equipment near overhead powerlines. Proper safety procedures for controlling these hazards were not implemented.

Common incident causes identified include:

- no "powerline corridor access permit" procedures in place;
- contractors or employees were not aware of the site's powerline corridor access permit system;
- error of judgment by mobile plant operators;
- absence or inadequacy of signage around powerline corridor; and
- potential hazards of working near powerlines not identified on the job safety analysis (JSA).

The possible consequences of powerline contact or near-contact include:

- electrocution or electric shock to operators and bystanders;
- damage to mobile plant;
- damage to infrastructure;
- tyre explosions and fires; and
- electrical flash-over or arcing.

Recommendations

- Establish a powerline corridor access permit procedure.
- Train all employees, including contractors, in the requirements of the permit procedure.
- Consider all overhead powerlines as energised until the line owner or electric utility indicates otherwise.
- Install adequate signage (Figure 2) at road crossings along the powerline corridor to warn plant operators of the hazard.
- Where necessary, define the areas that cranes and other mobile plant should not enter using warning signs, rigid barriers or tape barriers with high visibility 'bunting' or similar to delineate the limits of the approach distance.

MINES SAFETY BULLETIN NO. **85** CONTINUED

Figure 2 Examples of warning signage (top) and clearance indicator (bottom) on approach to high-voltage overhead powerlines on a mining operation

POWERLINE VOLTAGE (PHASE TO PHASE) (kV RMS)	MINIMUM SAFE DISTANCE (METRES)
Up to 1.1 kV	1.0
Greater than 1.1 kV and less than or equal to 33 kV	2.3
Greater than 33 kV and less than or equal to 66 kV	2.5
Greater than 66 kV and less than or equal to 110 kV	3.0
Greater than 110 kV and less than or equal to 220 kV	4.0

Table 1 Minimum clearances for vehicle movement in the vicinity of overhead powerlines. Reference: AS 3007.5:2004, table 2

- Identify and agree on permissible routes for mobile equipment based on the location of powerlines. In particular, know the location and voltage of all overhead powerlines at the site before operating or working with any crane. Many accidents arise when operators deviate from established routes.
- Before any work is performed near powerlines, identify all the hazards and set-up appropriate control measures on the JSAs. Evaluate the job site to determine the safest areas for material storage, the best placement for machinery during operations, and the size and type of machinery to be used.
- If powerlines cannot be de-energised in a work area, only operate mobile equipment in the area if the safe minimum clearance (i.e. distance between the powerlines and any part of the equipment or its load; Table 1) can be maintained, as prescribed in Australian Standard

AS 3007.5:2004 *Electrical installations – Surface mines and associated processing plant – Operating requirements*.

- Where it is difficult for the mobile plant operator to maintain safe clearance by visual means, designate a person to observe the clearance and give immediate warning before equipment reaches the limits of safe clearance.
- Before beginning operations near powerlines, notify the line owner (or authorised representative) and provide relevant information, such as type of equipment (including length of boom for cranes) and date, time and type of work involved.
- Train workers to recognise the hazards associated with high-voltage overhead powerlines, and the proper techniques to use when rescuing persons or recovering equipment in contact with electrical energy.

Procedure to follow in the event of mobile equipment contacting powerlines

The following actions are recommended should contact be made with a live overhead powerline or a flash-over occurs between a live overhead powerline and a crane or other item of mobile plant.

- Stop all work in the vicinity of the incident and summon help to have the powerline isolated.
- Keep all personnel away from the mobile plant, ropes and load, as the equipment and ground around the machine could be energized (Figure 3). Be aware that any fallen conductors could also whip around unexpectedly.
- If assistance is unavailable, attempt to break the machinery's contact with the live overhead powerline by moving the jib or driving the machine clear.
- Jumping from affected plant while the powerline is still energised is not recommended and can result in serious injury. However, where there is a risk of imminent danger, such as fire, jumping may be a necessary option. Leap clear of the plant and specifically avoid simultaneous physical contact between the plant and ground.
- Report the incident to management, any network authority and Resources Safety.

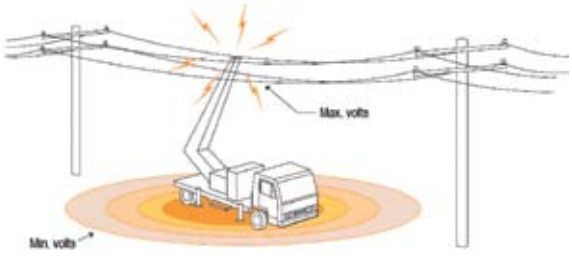


Figure 3 Diagrammatic representation showing mobile plant contacting high-voltage powerline and voltage gradient

- After de-energisation of the powerline, an exclusion zone of 300 metres should be maintained around rubber-tyred mobile plant for at least 24 hours after contact. This is to ensure that no-one is put at risk in the event of a tyre explosion. Further information on this hazard is available in Resources Safety's guideline on tyre safety, fires and explosions.
- Providing the electricity supply has been disconnected, operators may step across to an adjacent vehicle to avoid exposure to the risks posed by possible tyre explosion.
- The operator should be sent to have a precautionary electrocardiogram (ECG).
- When a crane or other item of mobile plant has been in contact with a live overhead powerline, it must be checked by a competent person for damage. Any actions recommended by the competent person must be completed before the mobile plant is returned to service.

MINES SAFETY BULLETIN NO. **86**

DEATH OF AN AIRLEG MINER IN A ROCKFALL – CORONER'S COMMENT AND RECOMMENDATION

13 JULY 2009

In his record of his investigation into the death of an airleg miner in September 2006, which was concluded recently, the State Coroner made the comment and recommendation noted below.

The deceased was struck while working on drilling stripping holes in the sidewall of his work area. He was struck by a large rock, which fell under gravity from the point of intersection of the backs and sidewall.

At the inquest, there was debate about the adequacy of the ground support (and the clarity of written instructions issued about it) and the lighting available to the deceased. A possible factor in the death was the ability to distinguish (with the lighting available – a standard cap-lamp) between two rock types of very similar appearance and to identify rock structure and discontinuities that may have revealed the presence of a wedge-shaped block of rock that could, potentially, fall under gravity if not adequately supported.

The Coroner commented that, in his view, the case had highlighted the need to have additional sources of light available in such mining areas where it might be important to be able to distinguish differences in rock type and to easily identify potentially adverse structures in the rock.

The Coroner also recommended that:

"… when airleg miners are working as contractors underground and are required to install ground support, they be provided by mine management with a short document which clearly identifies the precise extent of ground support required, including the circumstances in which it appropriate for those miners to exercise their discretion to provide additional support."

The Coroner's comment and recommendation in this case are drawn to the attention of the managers of underground mines where airleg operations are carried out, with the further recommendation of the mines safety inspectorate that they are reviewed and acted upon where they may be applicable to those operations.

MINES SAFETY BULLETIN NO. **87**

EXCAVATING NEAR CABLES BURIED IN THE GROUND

20 JULY 2009

Background

Three recent incidents involving excavator buckets contacting buried electrical cables at mineral treatment plants raise obvious concern and serve to remind responsible persons of their obligations to safeguard against this hazard. One incident involved a "bobcat" doing regular clean-up, and the others involved larger machines excavating new cable trenches.

Immediate causes or contributory factors

- Risk assessments to identify the hazards and necessary controls had not been conducted.
- An established "excavation permit" system of work was either not in place or not adhered to.
- Plans showing the locations of buried services had not been updated.

Recommendations

Prior to commencing any excavation work deeper than 300 mm, always consider the potential for impacting buried services (risk assessment).

"Excavation permit" procedures must be established and maintained at all mine sites in accordance with Mines Safety and Inspection Regulations 5.13 and 5.31, which require:

- the manager of a mine to ensure that excavation work is not commenced in the vicinity of buried cables unless a permit to do so has been issued by an authorised person;
- authorised persons to specifically identify the location of the excavation work, consult plans showing the location of buried services, and detail on any permit issued to persons carrying out the work any precautionary measures that need to be taken;
- the location and details of all buried high-voltage and low-voltage cables at the mine to be recorded on plans that are kept up-to-date and accessible by all persons who might need to use them; and
- cables buried in the ground to be:
  - installed in accordance with Australian Standard AS/NZS 3000:2007 *Electrical installations*,
  - installed with orange cable marker tape and surface cable route indicators, and
  - mechanically protected by either wire armouring or a substantial heavy duty wiring enclosure.

Most importantly, employers have a duty to ensure all employees involved in excavation work have been properly trained and assessed in the system of work, and records of that training and assessment are maintained.

PETROLEUM SAFETY SIGNIFICANT INCIDENT REPORT NO. **0109**

SIDE-BOOM CONTACTS POWER LINE

4 MAY 2009

Incident

A side-boom was working in tandem with a second side-boom to move a pipeline segment into a trench. The working side of the trench had been elevated by placing the spoil on that side. The segment movement was anticipated to be the last of the day and the operators began the move without a spotter.

The side-boom either contacted, or approached close enough to cause an arc from, a 22 kV power line. The power line broke. The live end ignited a small grass fire and the dead end came to rest on the side-boom.

The operator left the side-boom shortly after the power line broke and while the dead end of the power line was still in contact with the side-boom.

The trench had only been recently excavated and catenary markers to show the power line's location and safe working distance had been removed for excavation.

Contributory factors

- Power line catenary markers had been removed for previous excavation of the trench.
- Side-boom operators worked without a spotter for the brief period leading up to the incident.
- Side-booms were operating on raised ground due to spoil from trench being on the working side of the trench.

Comments and preventative actions

- Mechanisms such as catenary markers at power lines are in place to identify the power line location and indicate the separation distance that must be maintained. Any modifications should be controlled and the mechanisms reinstated when the purpose for removal is completed.
- Working procedures such as the requirement for a spotter are in place to achieve consistent and safe work practices. Minor deviations from procedures can have significant consequences.
- The working height for pipe lifting equipment during pipeline construction is readily controllable given the excavation equipment involved. Equipment and operator capabilities and overhead hazards should be taken into account when establishing locations for storing spoil during pipeline construction.
- The action of the operator to leave plant that is in contact with a fallen power line could have been fatal if the line was live. Remaining within the insulated cabin of the side-boom would have been the safer option.

  The use of job hazard analysis (JHA) or similar pre-start hazard identification should include the appropriate response for equipment contacting power lines where work is being conducted near power lines, and consider the ability of the equipment to provide isolation from potential shocks.
- In Western Australia, two companies control the majority of power networks and have requirements for working around their assets. Western Power (www.westernpower.com.au) in the South West and Horizon Energy (www.horizonpower.com.au) for the remainder of the state provide advice regarding working near power lines. When operating in remote Western Australia, information about working near power lines can be obtained from the nearest Horizon Energy regional office.

DANGEROUS GOODS SAFETY BULLETIN NO. **0109**

RISK ASSESSMENT REQUIREMENTS FOR FIXED UNDERGROUND EXPLOSIVES MAGAZINES

3 AUGUST 2009

Background

Applications submitted to Resources Safety for licensing of underground fixed magazines have not been supported by proper risk assessments outlining risk control and mitigation measures for the safe storage of explosives. This raises concerns about the location of the magazines.

The inappropriate location of fixed underground magazines with inadequate separation distances can, in the case of an accidental explosion, result in an excessive air-blast hazard to persons, machinery and infrastructure in the mine.

Issues

- Australian Standard AS2187.1:1998 *Explosives – Storage, transport and use – Storage*, section 2.6.2, does not prescribe quantity-derived separation distances between the explosives storage and the critical infrastructure of the mine (e.g. decline, electrical sub-stations, pumps). In general, licence applications for fixed underground magazines do not adequately address the risk arising from the explosives as a function of quantity and proximity to critical infrastructure.
- The storage quantities of explosives proposed in licence applications are generally higher than previously permitted under the provisions of the Mines Safety and Inspection Regulations 1995.
- The existing fixed magazine facilities at some underground mines have not been adequately planned in relation to the risk presented by the storage of large quantities of explosives underground.

Requirements

An adequate risk assessment must be conducted for each underground fixed magazine, taking into account the quantity of explosives in the magazine and its proximity to critical mine infrastructure. The assessment must consider the effects of a potential explosion on the safety of persons working underground and their evacuation from the mine.

To progress an application for a licence to store explosives in a fixed underground magazine licence, applications must be accompanied by assessment documentation that demonstrates:

- the risk presented by the proposed underground fixed magazine (i.e. location, design, and quantity of explosives to be stored) has been evaluated and found to be acceptable and as low as is reasonably practicable; and
- adequate and appropriate risk control and mitigation measures are in place.

Licensees are reminded of their duty to assess and minimise risk from dangerous goods, as required by the *Dangerous Goods Safety Act 2004*.

DANGEROUS GOODS SAFETY BULLETIN NO. **0209**

FIRE SUPPRESSION MEASURES FOR FIXED UNDERGROUND EXPLOSIVES MAGAZINES

3 AUGUST 2009

Background

A poorly designed and installed fire suppression system in a fixed underground magazine can result in a failure to extinguish an accidental outbreak of fire in the magazine. This can lead to an explosion of products in the magazine and present a major air-blast hazard to persons working in the mine.

The Dangerous Goods Safety (Explosives) Regulations 2007 require that fixed underground magazines for the storage of explosives comply with Australian Standard AS 2187.1:1998 *Explosives – Storage, transport and use – Storage*, clause 2.6.2.

Clause 2.6.2.6 of AS 2187.1:1998 describes firefighting systems for underground fixed magazines.

Applicable references to fire protection deluge systems are Australian Standard AS 2118.3:1997 *Automatic fire sprinkler systems – Deluge* and National Fire Protection Association Code NFPA 15, 2007 *Standard for water spray fixed systems for fire protection*.

Issues

- Clause 2.6.2 of AS 2187.1:1998 does not clearly describe the requirements for firefighting systems for underground fixed magazines.
- The design of a fire suppression system needs to address and minimise risk.

Recommendations

1. The following interpretations are to be applied for the terminology used in AS 2187.1:1998.

- *Remotely or automatically operated* – includes manual operation, provided that the manual operation point is at a safe distance and located upwind, outside of the magazine, and such that the operator can escape. Some fire protection systems cannot be manually overridden (see below).
- *Have pipelines and control valves that are fire-resistant, clearly marked and accessible from ground level* – includes fire suppression systems that incorporate fire-resistant pipelines and control valves extending at least 10 m beyond the perimeter of the magazine (e.g. PVC or plastic pipes may be used to transport water to the desired location, so long as all piping within a 10 m boundary of the magazine is fire-resistant). Manual release valves are to be positioned on the ventilating air intake side. Stainless steel piping may be suitable in areas where hypersaline water results in corrosion problems.

- *Be of a sprinkler type where a diesel-powered vehicle can enter the underground magazines* – includes deluge systems, but is not limited to the definition of "sprinklers" as specific to the fire protection industry. The term "sprinkler type" should be understood as simply meaning a scattering of small drops or particles.

  Fire sprinkler systems (e.g. closed bulb wet sprinkler systems) are not recommended as these devices are individually activated by a rise in temperature. Fires involving explosives can build quickly and "get ahead" of sprinkler systems, rendering them ineffective. Furthermore, such sprinkler systems cannot be manually overridden, nor can they be remotely activated.

  Deluge systems are considered appropriate fire suppression systems for installation within underground fixed explosives magazines. Fires require oxygen, heat and fuel to burn. As the chemical format of explosives contains oxygen and fuel, it is difficult to effectively remove or suppress these components and extinguish the fire. Deluge systems, however, deliver sufficient water to cool the explosives, thereby removing one of the key requirements for sustaining a fire.

2. When designing and implementing a fire suppression system for underground fixed magazines, appropriate measures must be taken to mitigate risk, such as ensuring:

- personnel are trained in the use of the fire suppression system and can operate it in an emergency (e.g. training, instruction plates for operation of the system affixed at the manual operation point);
- the system is reliable (i.e. system components are appropriate for a damp environment, minimise electrical components);
- system components are rated for fire protection use;
- the system incorporates a minimum number of valves and such valves are only to be operated by authorised persons;
- pipework is sized to meet the water quantity supply requirement and installed in accordance with proper engineering principles;
- any applicable standards are followed for the installation of the system;
- the system is regularly inspected and maintained; and
- a reliable and sufficient quantity of water is available at all times and is generally independent of other pumping arrangements.

The Dangerous Goods Safety (Explosives) Regulations 2007 provide for "alternative safety measures" to comply with certain standards. A definition of this term is available within the regulations, but may be summarised as a measure that results in a level of risk equal to or lower than that set by the standard. For fire suppression systems, the requirement is to extinguish fire in an underground fixed explosives magazine.

Licensees are reminded of their duty to assess and minimise risk from dangerous goods, as required by the *Dangerous Goods Safety Act 2004*.

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For dangerous goods emergencies or accidents requiring attendance of emergency services, caller must dial 000

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2009-10 CALENDAR OF RESOURCES SAFETY EVENTS

2009 MINES SAFETY ROADSHOW

Regional venues

Kalgoorlie, Thursday 8 October
Tom Price, Wednesday 14 October
Bunbury, Friday 16 October

Time: 8.30 am for 9.00 am start, with 2.30 pm finish

Topics:
- Radiation safety
- Safe access
- Safety culture break-out session
- Manual tasks practical session

Metropolitan venue

Hyatt Regency, East Perth,
Thursday 29 October
(simultaneous webcast)

Time: 8.00 am for 9.00 am start, with 2.30 pm finish

Topics:
- Radiation safety
- Equipment access – design issues (Stuart Evans)
- Safety culture break-out session
- Process safety

Invited speaker: Stuart Evans, representing the Earth Moving Equipment Safety Round Table (EMESRT)

The EMESRT was formed in 2006 to establish a process of engagement between mining customers and original equipment manufacturers (OEMs) — a process designed to accelerate the development and adopting of leading practice designs of earth moving equipment to minimise health and safety risks. To date, the process has produced 15 design philosophies, and its success with earth moving equipment has seen the focus expand in 2009 to cover prioritised equipment from the exploration drilling, underground hard rock and underground coal and soft rock sectors.

Stuart Evans has been Global Environment, Health and Safety Director with Sandvik Mining and Construction (SMC) for three years. He has worked in health and safety and, more recently, environmental areas of mining, oil and gas and nuclear industries for nearly 30 years. Stuart has been involved in EMESRT since its inception, firstly from a mining company perspective, then providing consultancy services and now working for an OEM.

Stuart's presentation will overview EMESRT's work so far and its expectations for the future.

For further information or to register your interest, please visit the DMP events page at www.dmp.wa.gov.au

2010 EXPLORATION SAFETY ROADSHOW

March 2010

Date: To be confirmed

Time: 8.00 am for 8.30 am start, with 11.30 am finish

Locations: Perth and Kalgoorlie (videoconference with simultaneous webcast)

Topics:
- Drilling safety
- Contractor and principal employer relationship
- Camp management

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