

minesafe

WESTERN AUSTRALIA

Volume 18 no.1 **MAY 2009**



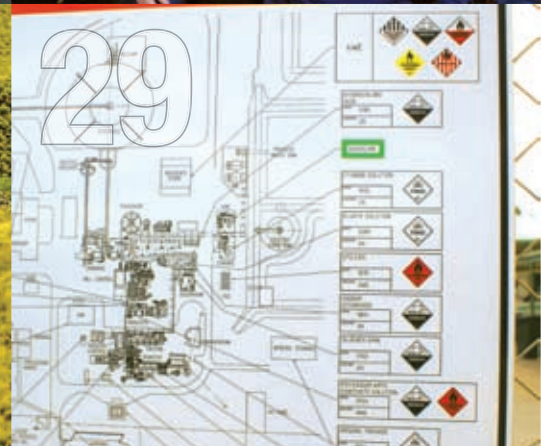
Government of Western Australia
Department of Mines and Petroleum
Resources Safety

Introducing DMP

.....
NOISE AUDITS —
BE PREPARED
.....

CONTROLLING DUST
.....

SAFETY CASE REGIME



Welcome to the first issue of *MineSafe* for 2009. It is also the first under the Department of Mines and Petroleum's banner and has a new reader-friendly format — feedback is invited.

In possibly his last article as State Mining Engineer before he retires, Martin Knee finishes his look at the origins of our mining legislation. There is also coverage of legislative news relevant to resources safety in Western Australia, including the release of the Kenner Report.

We continue the series of "Who's who" type articles featuring Resources Safety staff, and highlight the skills and expertise they bring to the safety and health domain.

Topics covered under the occupational health theme include an update of the ongoing project on manual tasks, advice to be prepared for noise audits, a report on the recent national meeting of occupational hygienists, and a call for participants in a project examining dust management in exploration drilling.

Following the inaugural Exploration Safety Roadshow held late last year, there was an increase in the number of queries regarding the type and depth of information required for the exploration operation notification form, so guidance is provided to assist in the notification process.

In line with the Deputy Coroner's recommendations following a mining fatality, suppliers of a mortar-type device for bringing down hang-ups in underground mines are now required to provide comprehensive training material. The coroner's findings and special precautions when using such a device are summarised in the dangerous goods safety section. This section also draws attention to some compliance issues for mines.

This issue introduces a new section on petroleum safety featuring Western Australian onshore hydrocarbon and geothermal-related news and projects that may involve Resources Safety staff at some stage in their development.

In line with its education and information strategy, Resources Safety continues to produce resources and update the internet to assist people looking for guidance material. Some of the recent releases and online changes are described in this issue. Specific information is provided for safety and health representatives. There is also a compilation of Resources Safety contacts.

In the industry performance section, we overview the recently published 2007-08 safety performance statistics, and Resources Safety's new Director of Mines Safety calls for debate on the merits of a safety case regime for the State's mining sector.

In another new section, "Crunching the numbers", you will find data collected by Resources Safety that may be of general interest, particularly in relation to health assessments.

This issue also recognises some industry people and organisations working to improve safety and health outcomes in Australia.

Resources Safety's roadshow program continues, with a report on the 2008 Exploration Safety Roadshow and some information on events planned for the next 12 months.

Two significant incident reports and a safety bulletin round out the content of this bumper issue.

Enjoy your reading.

Malcolm Russell
Executive Director, Resources Safety



CONTENTS

FROM THE STATE MINING ENGINEER

02 Nothing new under the sun

04 INTRODUCING THE DEPARTMENT OF MINES AND PETROLEUM

06 LEGISLATIVE NEWS

INTRODUCING RESOURCES SAFETY STAFF

08 From geologist to mining engineer to director

10 Casting a legal eye

12 Resources Safety's statistical expert

14 Health manager strives for healthy workforce

OCCUPATIONAL HEALTH

16 Manual tasks project update

18 Noise audits - be prepared

20 Hygienists discuss occupational health forensics

EXPLORATION SAFETY

21 Controlling dust during exploration operations

23 Notifying Resources Safety about exploration operations

DANGEROUS GOODS SAFETY

24 Bringing down hang-ups with a mortar-type device

28 Dangerous goods safety compliance for mines

PETROLEUM SAFETY

30 Tight gas at Warro

31 Geothermal exploration underway in WA

GUIDANCE MATERIAL

32 Guiding hand for dangerous goods

33 Catalogue of eForms grows

34 Navigating the web

INDUSTRY PERFORMANCE

36 Latest WA mining safety performance figures

40 Miners urged to consider safety case regime

CRUNCHING THE NUMBERS

42 Assessing health

44 Monthly mining workforce

45 Where are they?

SAFETY AND HEALTH REPRESENTATIVES

46 Keeping informed

48 Getting through the barriers

49 Tara's journey to safety training

SAFETY AND HEALTH AWARDS

50 Mining institute health and safety award

recognises leadership and commitment

52 Innovative companies share in safety awards

RESOURCES SAFETY EVENTS

54 Exploration roadshow links to information highway

56 2009-10 calendar of Resources Safety events

SIGNIFICANT INCIDENT REPORTS AND SAFETY BULLETIN

58 *Mines Safety SIR 151* Crushed in a pinch point of fixed elevating work platform (EWP) — fatal accident

60 *Mines Safety SIR 152* Haul truck and light vehicle collision

62 *Mines Safety Bulletin 83* Earthing of ANFO loaders used underground

64 RESOURCES SAFETY CONTACTS

In what is likely to be my last article as State Mining Engineer, I thought I might follow up on the last issue's look back at Victorian times by going even further back.

On the fringes of the city of Bristol in the United Kingdom, where I was born and raised, lies the old mining area of the Mendip Hills. The limestone there hosts a variety of mineral deposits including lead, zinc and silver, which have been mined since pre-Roman times. As a kid, I used to play in the old Roman lead mines — not necessarily something I would recommend as a pastime to kids today!

Mendip was a Royal Forest after the Norman conquest of Britain — not a thick wood as you might think, but a forest in the old medieval sense of a royal hunting preserve, subject to its own special laws. The miners who worked in the forest had their own special laws governing their operations too. They had many more rights than people commonly had in those days when serfs were essentially bonded workers on their lord's estates. Along with those freedoms enjoyed by the miners came responsibilities too — and these were surprisingly close to what we know today in our own mining laws.

This material comes from the old Mendip mining charter set down in writing, around 1469 in the reign of King Edward IV, from the word-of-mouth, customary law by the Chief Justice of England, Sir William Coke — called “Lord Chocke” in the document, with the fine, independent attitude to spelling of those days. A dispute had arisen about the customary law and the Chief Justice was charged by the King to settle it and to codify the law.

In order to work a mine, the holder had to have a “Mining Licence” in much the same way as currently required by Western Australia's *Mining Act 1978*.

IRROT: IN Scaccario Domini Regis
(Enrolled in the Exchequer of Our Lord, the King)

THE OLD AUNCIENT custome of the occupacon of the Mynedries IN AND UPON THE KINGS MATIES FORREST of MEYNDEEPE WITHIN HIS MATIES COUNTRY of Somsett BEING ONE OF THE FOURE StapLes of ENGLAND wch hath bene EXERCISED USED AND CONTINUED THROUGH THE SAID FORREST FROM THE TIME WHEREOF man now LIVING hath NOE memory IS AS HEREAFTER DOth PARTICULARLY ENSUE:

FIRST That if any man WHATSOEVER hee bee THAT DOth INTEND to VENTER HIS Life to bee a WORKMAN IN THE MYNEDERY OCCUPACON hee MUST FIRST of ALL REQUIRE Lycence of the LORD of Soyle wher hee DOth PURPOSE to worke OR IN HIS absence of HIS officer as Lead Reve OR Bailye AND THE LORD NOTHER HIS BayLiffe OR officer CAN DENY HIM.

Then he had to peg his tenement — which was done by digging a pit on the lead vein or “rake”, standing in it up to the waist and throwing his pick (or “hack”) as far as he could in both directions up and down the line of the vein. Where the pick landed a cairn of stones was built, and everything between the two cairns was the exclusive right of the holder.

ITEM That every man THAT DOth BEGIN HIS pITT OR GROOVE SHALL HAVE HIS HACKS THROW TWO wayes after the RAKE; AND NOTE THAT hee THAT DOth THROWE THE HACK MUST STAND IN HIS SAID GROOVE TO THE GIRDLE OR WAST AND THEN NOE man SHALL OR MAY worke WITHIN THE COMPASSE of HIS SAID HACKS THROW.

A “royalty” of 10 per cent had to be paid to the land-holder in much the same way that the State collects such payments today.

ITEM That when a WORKMAN hath LANDED any oare hee may CARRY THE SAME TO CLENSING AND BLOWING TO WHAT MINEDRIE hee SHALL PLEASE FOR THE MORE speedy



Nothing new

MENDIP MINING CHARTER, CIRCA 1469

making of the same soe that hee doe trulie pay the tenth thereof to the Lord of the soyle where itt was Landed.

There were penalties for infringement, especially for the offence of taking ore that rightly belonged to someone else, although in those robust days they were of a violence that might seem a little “over the top” to us, involving the culprit forfeiting all his metal and then having his premises burnt around his ears!

ITEM that if any man of that occupacon doe pick or steale any Lead or Lead oare to the value of xiiid.ob. the Lord or his officer may arrest all his Lead and oare house or heaths wth all his Grooves and workes and keepe them as a forfeit to his owne use AND shall take the person that soe hath offended and bring him where his house or worke and all his tooles and INSTRUMENTS beLONGING to the same occupacon been and put him into his house or worke and set fire in all together about him and banish him from tha occupacon before all the Myneders for ever.

And lastly, there was provision for safety (in a basic form) and mine rescue (though, it seems, not with much thought of success).


ITEM That if any man by the meanes of this doubtfull and dangerous occupacon doe by misfortune take his death as by falling the earth upon him by drowning by stifling wth fire or otherwise as in times past many have bene The workmen of his occupacon are bound to fetch the body out of the earth and bring him to Christian buriaLL att their owne proper Costs and Charges although hee been threescore fathom under the earth as heretofore hath bene seene AND the Coroner or any other officer att Jurye shall not have to doe wth him nor them.

We have come a long way since those days, but we still have a long way to go. Goodbye, good luck, and keep each other safe.

MARTIN KNEE, STATE MINING ENGINEER

Bee it Right Well Knowne That this is enrolled in the Kings Highnesse Exchequer by the time of King Edward the fourth of a great debate that was in the County of Somset Betweene the Lord Bonvills Tenants of Chuton and the Prior of Greene Oare the said Prior complained unto King Edward of great Injuries and wrongs that hee had upon Meyndeepe being the Kings Forest. The said King Edward commanded my Lord Chocke being Chiefe Justice of England to goe downe into the Countrey of Meyndeepe and sett a Concord and peace in the Countrey upon Meyndeepe upon paine of his high displeasure. The said Lord Chocke sate upon a place of my Lord of Bathes called the fordge upon Meyndeepe where hee commanded all the Commoners to appeare there and in especiall the foure Lords Royall of Meyndeepe THAT IS TO SAY my Lord the Bishop of Bath and Wells my Lord of Glastenbury my Lord Bonvile Lord of Chuton and Lord of Richmond wth all the appearance to the number of tenn thousand people. A Proclamacon was made to enquire of all the said Companie how they would bee ordered. Then they all wth one assent made answer and said That they would bee ordered and tried by the foure Lords Royall. Then the foure Lords Royall were agreed That all the Comoners of Meyndeepe dwelling in their Tenements being wthin the bounds of Meyndeepe should turne out their Cattle att their outLetts as much the Summer as they been able to keepe the Winter without hounding or pounding upon whose ground soever they went to take their course and recourse. To this the said foure Lords did put their Seales. AND alsoe were agreed that whosoever should breake any of these bounds should forfeite to the King one thousand Markes and all the Comoners their bodies and goods att the Kings pleasure that doth either hound or pound.

under the sun

A close-up portrait of Minister Norman Moore, an older man with grey hair, glasses, and a mustache, wearing a dark suit and white shirt. He is smiling slightly and looking directly at the camera against a solid red background.

INTRODUCING THE DEPARTMENT OF MINES AND PETROLEUM

Minister Norman Moore

The Department of Mines and Petroleum (DMP), the State's lead agency dedicated to servicing the mining and petroleum sectors, came into force on 1 January 2009.

The newly formed DMP is responsible for presenting Western Australia as an attractive destination for investment in resources exploration and development.

It also carries responsibility for the regulation of the State's successful mining and petroleum sectors, as well as the emerging fields of geothermal energy and carbon capture and storage. DMP guarantees security of tenure, collects royalties and regulates safety.

The department was created following the restructure of the former Departments of Industry and Resources (DOIR), and Consumer and Employment Protection (DOCEP).

As a result of the restructure, DMP acquired the Resources Safety Division previously housed at DOCEP. As well as regulating the occupational safety and health of mining and onshore petroleum operations in the State, the division regulates the movement of dangerous goods. It is expected

that this move will eliminate some inefficiencies while creating additional clarity and consistency for the resources industry.

The new department also includes groups from DOIR devoted to mineral titles, petroleum and geothermal energy, royalties, environmental issues, geoscience information, policy and corporate services.

Resources Safety has remained located at Cannington while the other groups have been consolidated at Mineral House on Adelaide Terrace.

Mining and petroleum companies can expect to see improved high levels of service from the new department according to Dr Tim Griffin, who is Acting Director General of the new department until Mr Richard Sellers takes up his appointment as Director General.

"DMP will focus on immediate goals of Government such as improving the approvals processes, attracting exploration investment, and strengthening regulatory frameworks, particularly in the areas of petroleum and minerals safety regulation," Dr Griffin said.

"It is also imperative that DMP embraces new opportunities and establishes the basis for a modern, forward-looking organisation to manage the large resources sector that delivers

“

A RECOMMENDATION
BY COMMISSIONER
KENNER THAT A RISK
MANAGEMENT MODEL
OF SAFETY AND HEALTH
REGULATION BE
IMPLEMENTED IN THE
WESTERN AUSTRALIA
MINING AND MINERALS
PROCESSING INDUSTRY
WILL BE CAREFULLY
CONSIDERED BY THE
GOVERNMENT ”

NORMAN MOORE

”

DMP

significant benefit to the Western Australian community.”

The new Minister for Mines and Petroleum, Norman Moore, has made improving the approvals process one of his first orders of business in State Government, and the department is taking the lead in the reform process.

“Its number one responsibility is to improve the approvals process for the resources sector, in concert with a whole-of-government approach which is being undertaken across all agencies,” Minister Moore said.

Dr Griffin said the department will ensure those elements of the approvals process within the department’s jurisdiction are acted on in a timely and efficient manner.

DMP will also work closely with other Western Australian Government agencies to improve its use of delegations and parallel processing for environmental approvals, and to seek opportunities to clarify and streamline matters related to Aboriginal heritage and Native Title.

To assist and provide a focus for this reform, Minister Moore has established an industry advisory group on improving the approvals process.

The group is chaired by former Western Australian Resources

Minister Peter Jones and has 12 members in total, each with particular knowledge of the State’s mineral and petroleum industry. The group presented its report to the Minister in early May.

“DMP expects to address recommendations coming from the Minister, and his advisory group, on this matter as well as to provide input to broader approvals reform processes within State Government being led by a Director General’s Working Group,” Dr Griffin said.

DMP is developing the regulatory framework to accommodate new developments such as uranium mining and carbon capture and storage. The department is also ensuring the economic sustainability of the mining and petroleum industry by working to encourage exploration, with a strong focus on greenfields areas of the State.

For Resources Safety, a major focus of future work will be concerned with the recommendations of the Kenner Report. Minister Moore has said that a recommendation by Commissioner Kenner that a risk management model of safety and health regulation be implemented in the Western Australia mining and minerals processing industry will be carefully considered by government.

COMMENT SOUGHT ON PLANT DESIGN STANDARD

The Australian Safety and Compensation Council (ASCC) develops and promotes national occupational health and safety standards and national codes of practice. These standards and codes of practice aim to improve the health and safety of workers and to facilitate consistent legislation in the states and territories. They are developed in close consultation with stakeholders and are regularly reviewed.

The *National Standard for Plant* was declared in 1994 by the National Occupational Health and Safety Commission and established hazard identification, risk assessment and risk control processes for all types of plant.

The ASCC is reviewing the standard and is seeking comment on whether the proposed approaches to improve the regulation of plant design are appropriate in Australia. To assist in this process, the ASCC has released a discussion paper on safety requirements for the design, manufacture and conformity assessment of plant. The paper highlights specific areas where comment is sought and provides details on how to lodge a submission.

Comment closes on 15 May 2009. For further information and to make a submission, visit the ASCC website at www.ascc.gov.au

KENNER REPORT NOW AVAILABLE

Commissioner Stephen Kenner has completed the statutory review of the *Mines Safety and Inspection Act 1994* and submitted his report to the Minister for Mines and Petroleum. The report was tabled in Parliament on 8 April 2009 and is available from the Resources Safety website at www.dmp.wa.gov.au/ResourcesSafety in the mining safety legislation and policy section.

NATIONAL REVIEW INTO MODEL OSH LAWS

At the Workplace Relations Ministers' Council (WRMC) meeting on 13 February 2009, Ministers noted the second report of the National Review into Model Occupational Health and Safety Laws.

As required by the review's terms of reference, the second report contains findings and makes recommendations on other matters that were not covered in the review panel's first report. Matters relevant to a model Occupational Health and Safety Act address:

- scope and coverage, including definitions;
- workplace-based consultation, participation and representation provisions, including the appointment, powers and functions of health and safety representatives and committees;
- enforcement and compliance, including the role and powers of occupational health and safety inspectors, and the application of enforcement tools including codes of practice;
- regulation-making powers and administrative processes, including mechanisms for improving cross-jurisdictional cooperation and dispute resolution;
- permits and licensing arrangements for those engaged in high risk work and the use of certain plant and hazardous substances;
- the role of occupational health and safety regulatory agencies in providing education, advice and assistance to duty holders; and
- other matters the review panel has identified as being important to health and safety that should be addressed in a model Act.

The two reports combined make 233 recommendations, and they should be read together to gain an understanding of the overall balance of the proposals. Many of the recommendations are consistent with the occupational safety and health laws

in Western Australia but there are some that would alter the current position.

The reports are available at www.nationalohsreview.gov.au. Any enquiries about the review can be directed to the National OHS Review Secretariat by email at enquiries@nationalohsreview.gov.au or phoning 1300 131 798.

DMP LEGISLATIVE PROGRAM AS AT 31 MARCH 2009

MINES SAFETY AND INSPECTION ACT AND REGULATIONS

The Mines Safety and Inspection Regulations are being amended to make consequential amendments arising from the *Mines Safety and Inspection Amendment Act 2008*. Other amendments correct errors and update references. Amendments will adopt the new national standard for licensing persons performing high risk work.

DANGEROUS GOODS SAFETY ACT AND REGULATIONS

Seven sets of the Dangerous Goods Safety Regulations (Storage and Handling of Non-explosives, Major Hazard Facilities, Road and Rail Transport of Non-explosives, Explosives, Security Risk Substances, Goods in Ports and General) are being amended to correct errors and clarify provisions to reflect the intended outcome of the legislation.

PETROLEUM LEGISLATION

The Minister for Mines and Petroleum recently approved the development and review of regulations to support the *Petroleum Pipelines Act 1969* (PPA) and the *Petroleum and Geothermal Energy Resources Act 1967* (PAGERA).

Once proclaimed, the relevant provisions of the *Petroleum Legislation Amendment and Repeal Act 2005* (PLARA) together

with the regulations will introduce occupational safety and health and management of safety requirements.

Drafts of the regulations will be made available, in due course, for public consultation to allow stakeholder and industry input prior to finalisation.

DANGEROUS GOODS SECURITY CARD EXEMPTION PERIOD EXTENDED

Western Australian users of explosives and ammonium nitrate will continue to be exempt from holding a new security clearance card until the end of the year following an extension of the exemption period.

Minister for Mines and Petroleum Norman Moore extended the transitional period to 31 December 2009.

The Minister said that when the new security vetting provisions were in force, they would require all licence holders and their key supervisory employees to be security cleared by WA Police.

"In the form of photo identification, the Dangerous Goods Security Card will be issued by the Chief Dangerous Goods Officer on the advice of the Commissioner of Police," he said.

"That advice will follow the police security clearance that considers the applicant's criminal history and advice from the Australian Security and Intelligence Organisation. Security checking is deliberately complex, but my department is looking at ways to streamline the process.

"The exemption will enable the mining and associated industries that handle explosives and ammonium nitrate to continue to operate lawfully."



“ I BELIEVE THAT THERE IS A WILL WITHIN THE DEPARTMENT AND THE STATE GOVERNMENT TO IDENTIFY IMPROVEMENTS AND IMPLEMENT THEM ”

FROM GEOLOGIST
TO MINING
ENGINEER TO
DIRECTOR

SIMON RIDGE

Simon Ridge joined Resources Safety in February this year as the Director of Mines Safety. With a background starting out as a geologist in Zambia then underground shift boss in Botswana, he brings a wealth of experience and knowledge to this role, with a key responsibility to manage the mines inspectorate.

Simon said he was most looking forward to being involved with the transformation of the inspectorate to meet the challenges of the 21st century.

“As we all know, it has become increasingly difficult to attract and retain experienced qualified people into the inspectorate,” he said.

“We have struggled for many years to maintain our service to industry but we are now at a nexus point with the rapid approach of retirement for the baby boomers generation, many of whom are our most experienced inspectors.

“We need to consider what it is that we do and how we achieve our core business outputs, and if there is a smarter way to provide these outputs. I believe there is always room for such reflection and for improvements to be made, and I also believe that there is a will within the department and the State Government to identify improvements and implement them.”

Previous to his role at Resources Safety, Simon gained a closer insight into mine safety as the manager of mining and major hazard facilities at SafeWork in South Australia.

“I built and headed up the team that regulates the mining and major hazard facilities industry sectors in South Australia,” Simon said.

“During my time at SafeWork, legislation for major hazard facilities was yet to be promulgated. I was involved in developing guidance material and engaging the industry and community as South Australia progressed towards adoption of the major hazard facilities safety case style of regulation. This included being a part of the first major hazard facilities conference held in Australia.”

While at SafeWork, Simon also undertook a series of high profile investigations, with his team of inspectors, including an in-depth examination of a fatal explosives incident.

“In May 2003, three people died and a further two people were seriously injured when an explosives manufacturing plant exploded in Gladstone,” he said.

“I was the lead investigator for the incident and managed an onsite team for more than three months, gathering evidence over a square kilometre of bush. I spent a further 18 months piecing the explosives factory equipment back together and supervising in-depth forensic investigations.”

So how did Simon transit from doing geology for four years to working in the mines safety sector?

Simon says it was during his time in Zambia that he came to realise it was the mining engineers who were progressing to higher positions, whereas geologists had to wait to fill ‘dead men’s shoes’.

“I was given an opportunity to enter the graduate mining engineers development program when I was in Zambia, and also gained additional experience in Botswana as an underground shift boss,” he said.

“I then transferred, with my wife, to Pannawonica to become a shift foreman, and later general foreman. I was involved in shifting the company’s mining operations from the Robe deposits to Eastern Deepdale.”

Two years on from Pannawonica, Simon was recruited as an underground mine planning engineer by North Kalbarli Mines.

He took on positions as an open pit superintendent and underground section manager before being offered the opportunity to attend the Western Australian School of Mines.

After graduating as a mining engineer, Simon became a registered mine manager and then consultant before joining the former Western Australian Mines Department in 1990.

He spent five years in Karratha and eight years in Collie as a District Inspector of Mines before moving to South Australia in 2003.

In his current position at Resources Safety, Simon says the single biggest challenge for the team is maintaining improvements to achieve zero harm.

He said it is the division’s primary role to assist Western Australia’s industry on the path to zero harm.

“

THE CHALLENGE IS
KEEPING ABREAST OF ALL
THE THINGS THAT ARE
HAPPENING BECAUSE IT'S
AN EXTREMELY DYNAMIC
FIELD WE WORK IN

”



SH

CASTING A LEGAL EYE

MELINA NEWNAN

Extensive legal and policy experience across a number of Commonwealth and State Government organisations has made Acting Director of Business Development, Melina Newnan, a valuable addition to Resources Safety.

.....
 The Business Development Branch is responsible for:

- overseeing the division’s legislative review and reform program;
- promoting safety and health outcomes, including education and information;
- developing and managing divisional business strategies, planning and systems;
- providing executive support to consultative forums (e.g. Mining Industry Advisory Committee); and
- coordinating freedom-of-information access to documents.

Also responsible for leading the division’s Legal and Policy Unit, Melina oversees the drafting of amendments to the *Mines Safety and Inspection Act*, and provides advice on the Act’s implications and effects. She also provides advice on other legislation.

Melina said she is looking forward to the upcoming work potentially surrounding the *Mines Safety and Inspection Act*.

“There has been a statutory review of the *Mines Safety and Inspection Act*,” she said.

“Commissioner Stephen Kenner of the WA Industrial Relations Commission conducted the review and has handed his report to the Minister for Mines and Petroleum, Norman Moore. The report was tabled in Parliament in early April.

“The review recommends changes to the legislation, so we will be required to provide advice to the Minister on those recommendations. We will also be required to liaise with industry and unions to develop the legislative change and finally implement the changes. This will be a significant project.”

Melina said that Resources Safety’s role will not stop there, and the next step will be to educate the community and general industry about the amendments through various roadshows, publications and the website.

The former law graduate, from The Australian National University,

has also been involved in publishing articles in journals such as the *Trade Practices Bulletin* and the *Industrial Relations Digest*. Part of her role at Resources Safety has been to provide advice on both the *Trade Practices Act* and the *Industrial Relations Act*.

Melina has also worked as a legal advisor at the former Industry Commission, now called the Productivity Commission. The organisation is the Australian Government’s independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians.

She said her time at the organisation had provided valuable experience for her current role.

“At the Productivity Commission I was involved in preparing a number of reports with recommendations for legislative reform”, she said.

“Now at Resources Safety, which I joined in 2003, I am assisting the Department of Mines and Petroleum put forward its submission to the Productivity Commission.

“I was also a principal research officer in the Legislative Assembly Committee Office of the Western Australian Parliament, which gave me an insight into how the parliamentary system works.

“My experience working in Parliament has also been valuable, as I had the opportunity to prepare more than 30 Parliamentary Committee reports on a variety of legal and policy issues surrounding health and safety, dangerous goods, consumer protection and constitutional issues”

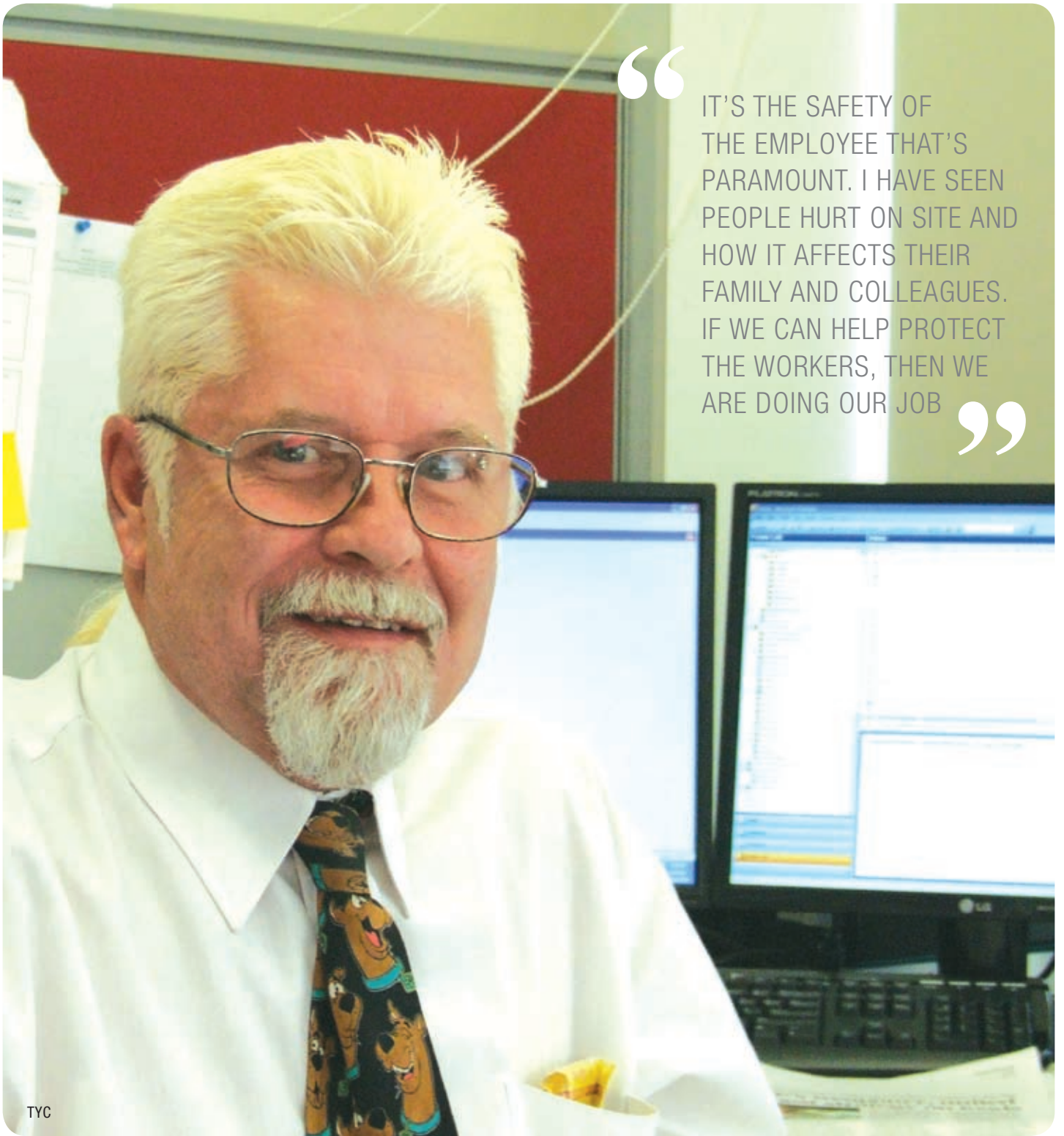
Despite her extensive knowledge and experience, Melina says she still faces challenges.

“It’s a very vibrant situation we find ourselves in, whether it be in relation to legal situations, interpretations of provisions of the legislation, finding ways to help our technical staff do their jobs, or looking strategically and long-term at what is happening in the industry both nationally and internationally”, she said.

“The challenge is keeping abreast of all the things that are happening because it’s an extremely dynamic field we work in.”

She said that the role of Resources Safety is extremely important to industry.

“It’s very important to ensure mines throughout Western Australia are operating safely. Resources Safety sees education as a key to developing a robust safety culture.”



“ IT'S THE SAFETY OF THE EMPLOYEE THAT'S PARAMOUNT. I HAVE SEEN PEOPLE HURT ON SITE AND HOW IT AFFECTS THEIR FAMILY AND COLLEAGUES. IF WE CAN HELP PROTECT THE WORKERS, THEN WE ARE DOING OUR JOB ”

TYC

RESOURCES
SAFETY'S
STATISTICAL
EXPERT

CHRIS STUBLEY

If anyone has a way with numbers, it is Chris Stuble, Mining Engineer – Projects with the Health Management Branch of Resources Safety.

A member of Resources Safety since 1988, Chris has been involved in analysing data from the division's AXTAT and incidents reports databases for more than 20 years.

The AXTAT database is used to record and retrieve information about lost time and disabling injuries resulting from accidents in the workplace. The incident reports database is used to record and retrieve information about incidents in the workplace, providing a useful tool for identifying trends in reported incidents and assessing risk.

The data are obtained from mining and exploration operators around Western Australia. Chris' primary responsibility is analysing the information gathered, and ensuring its integrity and accuracy.

Before starting at Resources Safety, Chris clocked up 15 years of experience working on mines around Australia. From a coal mine in New South Wales, a gold mine in Kalgoorlie, nickel mines in Kambalda and Leinster, and a quarry in Perth, Chris gathered a wealth of hands-on experience as a miner, engineer, underground manager and quarry manager.

Chris said the most challenging aspect of the role is keeping up with the pace of activity.

"It's a very exciting and challenging role — everything can be tracking along steadily, and then the work pace speeds up unexpectedly," he said.

"Recently, for example, we have received many queries regarding employee and contractor numbers, which peaked at almost 78,000 in October last year. And in this time of economic change, we will be closely tracking numbers to monitor trends."

Chris said enquiries regarding industry safety performance are quite diverse.

"We get questions from individual mine sites that want to benchmark their performance against other sites, questions from various industry organisations and State Government departments, and from Ministers," he said.

"We need to produce many reports to address these queries, so we need to determine the specific information required, extract it from the database and analyse its significance."

Chris said what he loves most about his job is being able to produce data that are as accurate as possible and knowing that this is contributing to industry's knowledge of accident and incident trends.

"It's great to know the data will help people on sites be more knowledgeable so that they can make their sites safer for the employees that work there," Chris said.

"It's the safety of the employee that's paramount. I have seen people hurt on site and how it affects their family and colleagues. If we can help protect the workers, then we are doing our job."

Chris' last words of advice to industry are to ensure information and details outlined on reporting forms are correct.

"Reading forms properly and filling them out correctly not only helps us ensure all information is accurate, but also saves our processing area and the person filling out the form lots of time."

WHEN DO I REPORT AN INCIDENT?

- Where a person suffers an injury as a result of an accident at a mine, and is unable to perform the work being done at the time of the accident, the manager must notify the District Inspector for the region in which the mine is situated.
- Although the immediate notification is by telephone, the details should be confirmed in writing as soon as practicable on an occurrence report form.
- At the end of the month following a lost time or disabling injury, the manager must send a completed mining injury report form confirming the information reported in the occurrence report form.
- The manager must submit a monthly status report form 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 report must be submitted whether or not there has been a reportable accident during the month.

NEED A REPORTING FORM?

Reporting forms can be requested from the AXTAT Manager:

Mail: Resources Safety
Department of Mines and Petroleum
100 Plain Street
East Perth WA 6004

Phone: (08) 9358 8469

Fax: (08) 9325 2280

Email: axtatmanager@dmp.wa.gov.au

“

OUR JOB IS TO
PROVIDE GUIDANCE
TO THE MINING
INDUSTRY ON HOW
TO BEST MANAGE
SPECIFIC HEALTH
ISSUES, AS WELL
AS MAKE SURE
COMPANIES ARE
LOOKING OUT FOR
THE HEALTH OF THEIR
WORKERS

”



HEALTH MANAGER
STRIVES FOR
HEALTHY WORKFORCE

LINDY NIELD

As Western Australia's only female inspector of mines, Lindy Nield, Resources Safety's Occupational Health Manager, offers a unique outlook to her job.

.....

In the management role since October last year, Lindy's experience working for the State Government's health and safety sector started ten years ago.

She said being one of the few females in this male-dominated industry allows her to bring different views to the table, helping to create a broader approach to solving problems.

Lindy said her primary responsibility is to provide support to a team of four specialist occupational health inspectors, who are in charge of checking all mines throughout Western Australia.

"Our job is to provide guidance to the mining industry on how to best manage specific health issues, as well as make sure companies are looking out for the health of their workers," she said.

"We also conduct audits, inspect mines and issue improvement or prohibition notices when we find serious occupational health and safety issues. Notices may relate to inadequate risk assessment or control of noise, harmful chemicals, heat stress or hazardous manual tasks."

One of the projects Lindy is currently working on is looking at hazardous manual tasks, with the aim of reducing musculoskeletal disorders across the industry.

"Following fatal accidents, strains and sprains are the big ticket injuries in the mining sector and what most compensation is spent on," she said.

"We are also focusing on noise exposure to reduce hearing loss in mining employees.

"Based on MineHealth assessments, it's becoming evident that many mining employees have serious hearing losses, and we need to continue 'beating the drum' that hearing loss is a preventable condition."

Other major projects Lindy is working on include reviewing the asbestos management guidelines and reporting on the MineHealth assessment data.

"Our newest recruit, Dave Fleming, from the WA ChemCentre, has a wealth of experience in chemistry and is interested in asbestos and other hazardous fibres," she said.

"Dave and I will be working together to consult with companies who come across asbestos or fibrous material during exploration, mining or processing operations. The aim of the consultation is to identify how these exposures can best be managed so that we can update our guidelines to reflect present experiences and best practice. Anyone who wants to be involved should contact us."

Lindy said MineHealth assessment information has been

gathered over the last 12 years and there is now sufficient data to analyse and report on in meaningful ways.

"Overall, we have found that industry is pretty healthy. However, smoking and obesity are overly represented in our study group," she said.

"We found that in the State's mining sector there is about double the proportion of smokers compared to the normal Australian population.

"Early data on weight and height indicate a higher than desirable rate of obesity exists among mine workers as well.

"This suggests there is a need to highlight the effects of these health risk factors specifically to mining employees.

"There is no excuse for mining workers not to leave work the same as they came or, in some cases, leave with better health — that's my goal in this role."

In addition to having a wealth of experience within the State Government arena, Lindy also worked as a lecturer for three years.

"I left the former Department of Industry and Resources in 2002 and took up lecturing at a number of TAFEs and universities," she said.

"I lectured on a variety of topics related to environmental and occupational health including chemistry, toxicology and health science communication. I also wrote and delivered a second and a third year unit for a degree at Murdoch University in Health Safety and Environment."

The former lecturer has also studied microbiology and completed a Masters in Immunology and Graduate Diploma in Occupational Hygiene.

Lindy said she finds her current role at Resources Safety both exciting and challenging.

"The biggest challenge is planning for the future," she said. "Our group has a wealth of experience within the industry, and my challenge is to create as many opportunities as possible to disseminate this extensive corporate knowledge to new employees.

"My job is full on and varied but that's what makes it so exciting. One minute I'm researching the toxicology of nickel, the next I'm giving advice about health surveillance for people working with arsenic, and then I'm discussing data collection for the National Mine Safety Framework initiative with officers from Canberra.

"I am also involved in giving seminars to noise and surface ventilation officers during their training, and have talked at the Mines Safety Roadshows for the past few years.

"Usually it's the science I really love about my role but I also enjoy the interactions with the people I speak to on a daily basis, and that's why I am not in a research laboratory."



MANUAL TASKS PROJECT UPDATE

As reported in the August 2008 issue of *MineSafe*, the report of the Manual Task Project Scoping Study recommended a number of activities aimed at reducing the extent and severity of injuries from performing hazardous manual tasks in the Western Australian mining industry.

With the assistance of a contract ergonomist, Resources Safety continues to implement these recommendations. Integral to this process is ongoing consultation with industry through regular meetings of the tripartite Manual Task Working Group, established in August.

The initial focus of the working group was to provide input and feedback on information products aimed at increasing the state of knowledge of manual task risk and management of that risk. Resources Safety also consults the group about future directions and proposed activities.

A webpage dedicated to hazardous manual tasks has been developed on the Resources Safety website in the occupational

health section. The webpage contains a number of resources to provide mining workplaces with the knowledge required to implement an effective systematic manual task risk management process through a participative ergonomics approach.

A systematic risk management process of hazard identification, risk assessment and risk control is the most effective way for workplaces to manage manual task risk. A participative ergonomics approach means that workers who do the task — the 'experts' — undertake the manual task risk management process.

Information about manual task risk, the risk management process and the participative ergonomics approach is summarised in a series of manual task fact sheets.

To further increase industry's awareness of this approach, Wendy Pietrocola, an ergonomist, was a presenter at the 2008 Mines Safety and Exploration Safety Roadshows. Her presentation can be downloaded from the hazardous manual tasks webpage.



Resources Safety also presented a manual task session, *Participative Ergonomics: Taking the Pain out of Manual Task Risk Management*, at the Chamber of Minerals and Energy of Western Australia's occupational safety and health conference this year — check out the Chamber's website at www.cmewa.com.au for speaker presentations.

Further educational activities are anticipated at similar forums. If you are involved in a professional organisation or group and would like more information, please contact us.

In consultation with the working group, Resources Safety is presently developing a manual task risk assessment tool and a manual task training package. These products will be trialled in mining workplaces and published on the hazardous manual tasks webpage when finalised.

If you would like to be involved in the working group or receive more information about the project, please contact Wendy Pietrocola, Principal Scientific Officer – Ergonomics (Wendy.Pietrocola@dmp.wa.gov.au).





TYC Mines inspector Brett Boneham discussing hearing protection at last year's Mines Safety Roadshow in Kalgoorlie

NOISE AUDITS — BE PREPARED

Occupational health inspectors from Resources Safety are continuing to target noise exposures when they do inspections and audits during 2009 and 2010. If your company hasn't been audited in the past five years, you may be contacted soon to arrange one.

Initially, the priority will be high risk sites — those where the noise report shows that a significant proportion of employees are exposed to levels above the action level. A significant proportion is considered to be more than 50 per cent of employees exposed to noise levels greater than LAeq(8h) of 85 dB(A).

The best way to prepare for an audit, so you get excellent results, is to do your own mock audit before the inspector arrives. This allows you to make the necessary changes in areas where compliance is poor. Resources Safety's noise audit guidelines and template can be downloaded from the mining publications section of the Resources Safety website.

Inspectors will need to see documented proof relating to each of following nine elements of the noise audit:

1. Noise control policy
2. Noise report
3. Noise control plan
4. 'Buy quiet' process
5. Noise control measures
6. Personal hearing protectors
7. Safety warning signs
8. Information, instruction and training
9. Noise dosimetry

A recent internal review of all noise audits undertaken since 1998 indicates that while most companies undertake noise monitoring, managerial commitment to reducing noise levels is often not confirmed in a noise control policy. Furthermore, the noise control plan is rarely completed or successfully implemented, and commonly there is no 'buy quiet' process in place.

The other common area of underperformance relates to information, instruction and training. Inspectors frequently see people in noisy areas either not wearing hearing protection or wearing it incorrectly. It is also common to see employees inserting earplugs after being in the noisy area for several minutes.



USE THE AS/NZS 1269 SERIES OF STANDARDS IN YOUR OCCUPATIONAL NOISE MANAGEMENT PROGRAM.

HAZARD IDENTIFICATION

- Identify potential noise hazards (AS/NZS 1269.1)

RISK ASSESSMENT

- Conduct noise assessment (AS/NZS 1269.1)
- Evaluate and rank noise sources (AS/NZS 1269.2)

HAZARD & RISK CONTROL

NOISE CONTROL MANAGEMENT (AS/NZS 1269.2)

- Eliminate or control the amount of noise to which people are exposed
- Establish noise control policies and management systems
- Arrange information and training
- Identify options for controlling excessive noise emission, immission and exposure
- Evaluate and select options
- Document noise control plan
- Implement, plan and monitor progress
- Review monitoring data regularly
- Report formally to senior management

HEARING PROTECTOR PROGRAM (AS/NZS 1269.3)

- Reduce risk arising from unavoidable exposure to excessive noise
- Establish information and training program
- Select protectors according to individual needs
- Signpost hearing protector areas
- Implement and monitor personal protector program
- Review monitoring data regularly
- Report formally to senior management

AUDITORY ASSESSMENT (AS/NZS 1269.4)

- Identify hearing impairments
- Conduct auditory assessment
- Arrange rehabilitation and compensation, if appropriate
- Follow-up results
- Report formally to senior management

PROGRAM EVALUATION

- Evaluate the overall occupational noise management program
- Audit each part at least annually

There is also the misguided belief that the best hearing protection is that which blocks out all sound. The goal of hearing protection such as plugs and earmuffs is not to eliminate noise but to reduce it to levels below the action level, allowing workers to continue to hear safety warnings and communicate if required.

As for all effective risk management programs, it is essential to identify, assess and control the hazard while continuing to check that the control measures are actually effective. Regular noise monitoring of equipment and personal sound measurements will indicate how effective noise controls are. Audiometric (hearing) tests will also provide information on how effective the noise control program has been. Analysis of Resources Safety's MineHealth data confirms that mining companies should not rely solely on personal protective equipment as many mining employees have already experienced significant hearing loss.

Further information on managing noise at your workplace is available from Resources Safety's *Noise control in mines – guideline* and Australian Standard AS/NZS 1269 Set:2005 *Occupational noise management* (Parts 0 to 4).

HYGIENISTS DISCUSS OCCUPATIONAL HEALTH FORENSICS

The 26th Annual Conference of the Australian Institute of Occupational Hygienists (AIOH) was held in Perth from 29 November to 3 December 2008. The conference was well supported by the Western Australian mining industry through significant sponsorship and substantial delegate representation.

.....

The conference theme was *Occupational health forensics – analysing the evidence to make a difference*. The aim was to inspire delegates by highlighting how the work of an occupational hygienist parallels that of a police forensic scientist. There are similar approaches to the identification, collection and analysis of samples, and legal compliance and excellent communication are essential for both professions. However, police forensic science is limited to investigation of past events whereas occupational hygiene's focus is to prevent harm.

The conference programme also introduced new techniques and approaches to existing issues, and outlined emerging issues that affect workers' health.

Plenary topics included:

- Forensic investigation basics (Mr Robin Napper, Forensic Investigations)
- REACH and the role of toxicology in regulating chemicals in the European Union (Dr Vicki Stone, Napier University, Scotland)

- Pandemic preparation (Dr Teri Lillington, Shell)
- Occupational health systems at Alcoa of Australia (Dr Michael Donoghue, Alcoa)
- Impact of asthma on the worker (Dr Guy Marks, Sydney University)
- Heat stress: effects on health and productivity (Dr Graham Bates, Point Health)
- Future occupational crime: a minority report on sins of omission (Dr Leon Straker, Curtin University of Technology)
- Emergency response – HAZMAT and counter terrorism areas (Dr Steve Wilkinson, WA ChemCentre)
- Risk assessment and management of mosquito-borne diseases (Dr Michael Lindsay, WA Department of Health)

Copies of the papers are available from the AIOH — contact Laura Loschiavo (ph. 03 9336 2290, laura@aioh.org.au).

A newspaper liftout, *Forensics at work*, was published prior to the conference to highlight and explain the work of occupational hygienists. It is available from the AIOH website at www.aioh.org.au in the special feature section.

The website also has information about the 27th annual conference, to be held in Canberra in December 2009. The theme will be *New and emerging issues* and the organisers are calling for papers.

CONTROLLING DUST DURING EXPLORATION DRILLING

Resources Safety is currently examining dust management in exploration drilling. The project focuses on reverse circulation (RC) drilling and its potential for producing high levels of dust and fibres. Workers exposed to such dust levels (in excess of statutory requirements) are at risk of harm to health — particularly in the longer term.

As part of this project, Resources Safety is seeking input from stakeholders (e.g. principal contractors, drilling companies, drill rig manufacturers) to establish industry best practice and future innovations in dust management strategies.

Consultative visits are being made to drilling companies to establish a benchmark for practicable dust management practices that can be applied on an industry-wide basis. Engineering controls to reduce dust emissions will be given priority over administrative procedures and personal protective equipment.

It is also envisaged that a forum for interested parties will be arranged for mid-2009 to share ideas, discuss challenges and determine timelines for meeting the project's objectives.

Contact Chris White, Principal Scientific Officer in the Health Management Branch (ph. 08 9358 8092, chris.white@dmp.wa.gov.au) for further information.



NOTIFYING RESOURCES SAFETY ABOUT EXPLORATION OPERATIONS

As required by section 47(3) of the *Mines Safety and Inspection Act 1994* and regulations 3.3 and 3.4 of the *Mines Safety and Inspection Regulations 1995*, an exploration manager must inform the senior inspector of general details regarding the location, scope and nature of any exploration operations in Western Australia.

The exploration operation notification form is the formal method for reporting those details to the mines inspectorate. The eForm is available in the mining forms section of the Resources Safety website. When completed correctly, this form is automatically submitted to the senior inspector for the region in which exploration will take place.

Resources Safety has received a number of enquiries regarding the form, particularly in terms of the detail required, so the following information provides guidance on completing the form, and covers situations when an amended notification will be required.

OPERATION DETAILS

General geographical location

Generalised locations, such as 'Kimberley region' or 'Goldfields', have limited value trying to locate operations. It is better to indicate the distance and direction from a known reference point, such as '70 km SW of Halls Creek' or '120 km N of Kalgoorlie'.

Tenement numbers where operations will take place

More than one tenement number may be listed if the exploration operations will be undertaken on a group of tenements in a specific area. However, if exploration operations are being carried out in geographically widespread locations then a separate notification form should be submitted for each group. For example, two notification forms should be submitted if a company's exploration program involved work on one tenement group in the Pilbara region (e.g. 50 km S of Newman) and another in the Yilgarn region (e.g. 15 km N of Southern Cross).

Period covered by notification

The exploration manager may provide details of the proposed exploration activity for either an ensuing six- or 12-month period.

Where practicable, information relating to an exploration operation needs to be notified to the senior inspector *before* work gets underway. Such information includes the proposed commencement and conclusion dates of the exploration activity.

Minor variations to the start or completion dates, in the order of several weeks, do not need to be notified by an amendment to the original notification.

NATURE AND SCOPE OF PROPOSED ACTIVITIES

Earth disturbing operations

These are operations that involve disturbing the ground by using machinery. Examples are drilling, costeaming and trial pit excavation.

Minor variations to the program of works (e.g. drilling of 80 holes rather than 60) *do not* require submission of an amended notification form. However, an amended notification form *would* be required if the nature and scope of works significantly changed and the altered programme of works results in additional hazards and risks to the exploration activity. An example is where a trial pit excavation is proposed as a result of a drilling programme and that excavation work had not been included in the original notification.

Other operations

These are operations that essentially involve people being 'on the ground' engaged in exploration work such as reconnaissance field trips, field mapping, geochemical sampling (where no drilling is involved), rock chipping and sampling, and reference point marking.

Activities that are not required to be reported in this section are remote sensing and photographic activity carried out using airborne or satellite mounted equipment.

BRINGING DOWN HANG-UPS WITH A MORTAR-TYPE DEVICE

In February 2006, the State Mining Engineer issued Mines Safety Bulletin No. 76 following a fatality associated with a mortar-type device used in some underground mines to bring down rock pass or drawpoint hang-ups. In relation to the same incident, the Deputy Coroner released her *Findings upon inquest into the death of Mark John Quinn on 12 January this year.*

So it is timely to re-emphasise the importance of:

- understanding the design and correct use of this device, and
- training of operators in its use.

Resources Safety is concerned about the potential dangers associated with misuse of this device. Apart from the fatality, the division is aware of three near-miss incidents involving premature detonation of the booster charge inside the launch-tube barrel. Fortunately, these did not lead to injury and the causes were different to those leading to the fatality.

The device resembles a military mortar in that it comprises a base plate containing a propelling charge, and a launch tube barrel, which can be used to fire a finned projectile containing a high explosive booster charge with an impact fuse detonator. The target of the projectile can be up to 100 m from the cannon.

As soon as the finned projectile containing the armed booster smashes against the blockage or hang-up, the spring in the impact fuse compresses and the anvil hits the primer. The primer then initiates the detonator, setting off the 2.2 kg high explosive booster charge and, hopefully, removing the blockage in the ore pass.

The potential for a premature explosion (see *Mines Safety Bulletin No. 78* describing a near-miss relating to an earlier quality control problem, since rectified by the supplier) means that it is essential that the device is fired remotely from a safe distance, using a sufficiently long shock-tube or electric wire.

Operators should undergo specific hands-on training using dummy explosives and field experience until the trainer is satisfied that they are competent to use the device.

Suppliers of this type of device are required by legislation to provide comprehensive training material that includes information on the safe assembly, use and the workings of the impact fuse, as also recommended by the Deputy Coroner.

The cross-sections of the impact fuse show the workings of the internal spring, which can be seen attached to the anvil or firing pin. A sufficiently strong impact on the armed projectile, if forced or hammered into a damaged launch-tube barrel, will compress the spring so that the anvil will hit and initiate the primer. As a consequence, the primer will initiate the detonator, which will initiate the booster, which will explode within the steel launch-tube barrel with potentially fatal consequences.

In line with the Deputy Coroner's recommendations, it is now a licence condition under the *Dangerous Goods Safety Act 2004* that each impact fuse sold comes with a technical information sheet and warning label 'shock sensitive', stencilled in white letters on the impact fuse housing.

All underground mining companies using this device should note the technical information available from the product supplier, and must provide thorough and specific training on the correct assembly and use of the cannon.

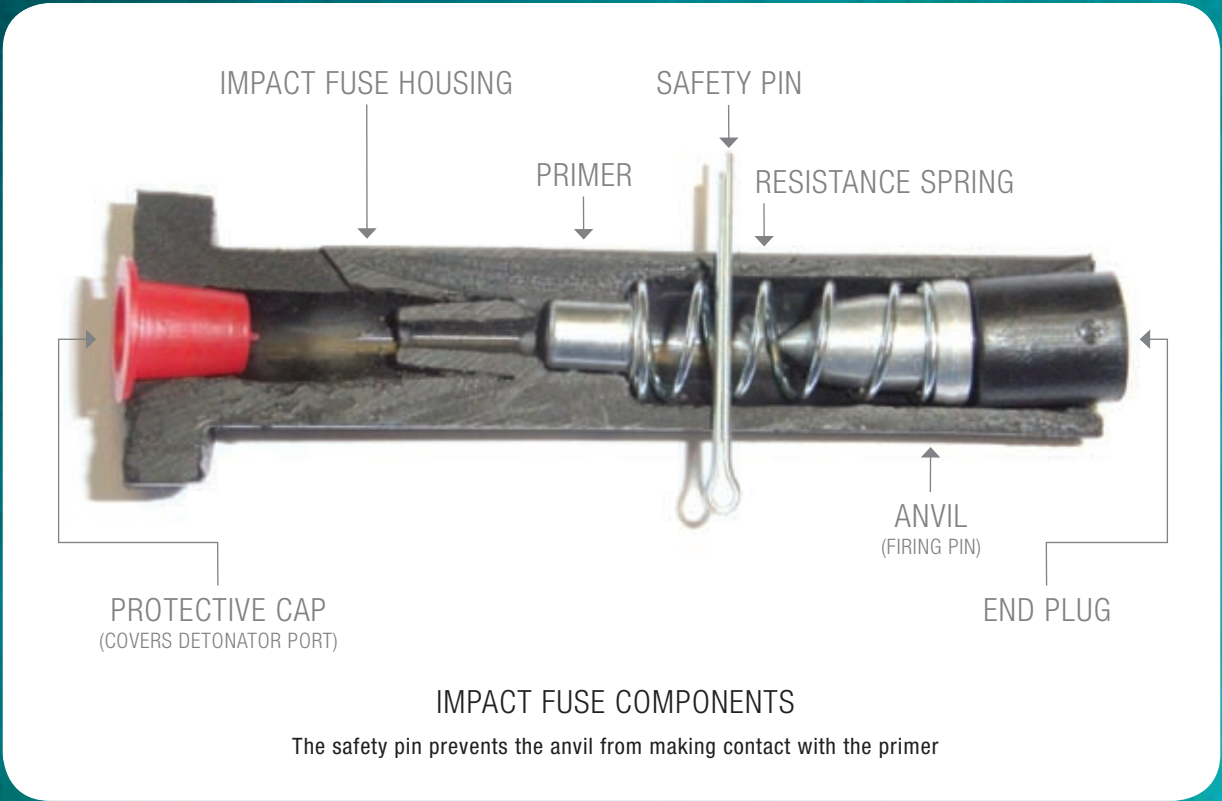


SPECIAL PRECAUTIONS WHEN USING A MORTAR-TYPE DEVICE

FROM MINES SAFETY BULLETIN NO. 76

- Only persons specifically trained in the use of mortar devices should be permitted to use them.
- Training should encompass all safety rules and warnings issued by the manufacturer of the device, as well as the normal methodology for the use of the device and any specific instructions for its use in particular circumstances.
- Discard criteria for the apparatus making up the device itself should be included and emphasised in the training program.
- Prior to use, the equipment must be thoroughly inspected. This would include an examination for damage to the barrel and a check for any built-up material inside the barrel, for example from rust or deposits from previous firings that may cause an obstruction.
- The propelling charge and its initiator must be inserted into the base plate of the device with care and sufficient length of lead wire or nonel shock-tube must be provided to ensure that ignition of the device can be carried out from a safe distance. This distance may well depend on the physical nature and configuration of the area where the device is deployed, and will certainly depend on the size of the high-explosive charge to be used.
- The launch tube or barrel of the device must be fixed to the base plate using a locking pin.
- The entire assembly must be firmly supported at the appropriate firing angle at the launch site and it must be assured that the device cannot slip during firing, particularly due to the reaction thrust during the projectile launching process.
- Any accessories provided by the manufacturer for the safe operation of the device must be employed according to the manufacturer's instructions. This particularly applies to the use of a specially designed 'pusher' plate between the fins of the projectile and the propelling charge to allow the thrust generated by the propelling charge to impinge fully on the projectile.
- The impact detonator fuse unit must be prepared exactly in accordance with the manufacturer's instructions and care must be exercised in its insertion into the projectile. Of particular importance is the use of the correct type and size of impact fuse device and detonator.
- Only high-explosive cast booster charges of the correct size should be used to arm the projectile. The booster cartridge should not protrude significantly from the end of the projectile.
- The projectile must be carefully loaded (with the pusher plate in position) into the launch-tube or barrel.
- **UNDER NO CIRCUMSTANCES SHOULD AN ARMED PROJECTILE BE FORCED OR HAMMERED INTO THE LAUNCH TUBE.**
- Initiation of the propelling charge should take place from a safe distance and the blast area must be barricaded and/or guarded to prevent inadvertent entry.
- Any unnecessary explosives and accessories must be cleared from the firing area prior to initiation of the propelling charge.
- Blasting fumes and dust must be allowed to clear before re-entry to examine the results of the use of the device.
- Any failure of either the propelling charge or the high-explosive charge must be treated as a misfire.
- Following a successful application of the device, both the launch-tube barrel and the base plate must be checked for damage by either the explosives employed or by falling rock dislodged from the hang-up.
- **IF THE LAUNCH TUBE BARREL IS DAMAGED OR DENTED SUCH THAT A NEW (UNARMED) PROJECTILE CANNOT BE FREELY INSERTED AND PASSED THROUGH THE FULL LENGTH OF THE TUBE, IT MUST BE DISCARDED AND REPLACED BY A NEW TUBE PRIOR TO RE-USE OF THE UNIT.**

CROSS SECTIONS OF QUICKDRAW™ IMPACT FUSE SHOWING HOW THE IMPACT MECHANISM WORKS (courtesy of RockTec Ltd)



SCHEMATIC OF QUICKDRAW™ SYSTEM (courtesy of RockTec Ltd)

CORONER'S FINDINGS

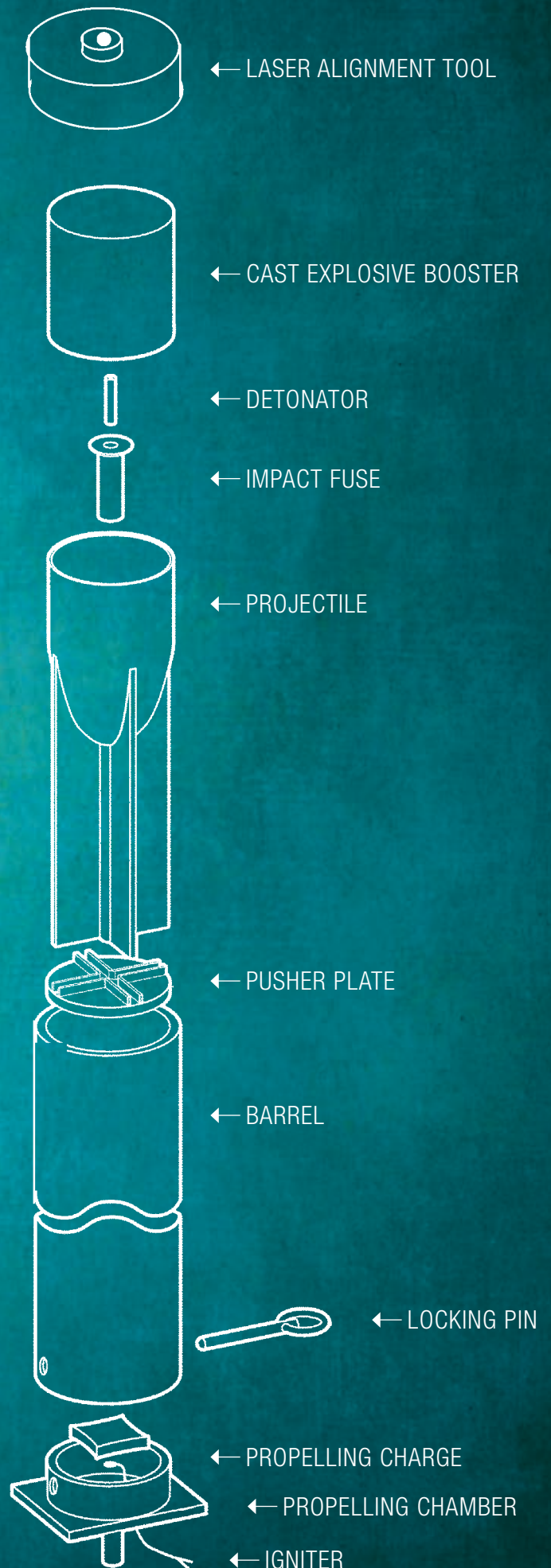
The Deputy Coroner found, among other things, that it was the tapping or hammering by the deceased against the bottom of the hard plastic pusher plate or tail fin of the armed projectile that caused the premature explosion, killing the operator instantly. The deceased was attempting to force the projectile into the bottom opening of a faulty, partially blocked launch tube barrel.

The Coroner stressed that one of the more important safety issues is the prohibition against the use of faulty barrels through which the projectile will not run smoothly. Faulty barrels must be discarded immediately and permanently. The steel barrels are not cheap, but mining companies must invest in a sufficiently large number of barrels so that miners intent on the urgent business of unblocking dangerous hang-ups find only perfectly operational barrels. There must be no temptation to resort to the use of rusty or dented, and therefore partially blocked, barrels.

The Coroner also recommended that Resources Safety require the following from the suppliers of such devices.

- Product information (i.e. technical information sheet) is supplied with the impact fuse to clearly explain the workings of the spring, and how compression of the relatively small and light spring will lead the anvil to hit and initiate the primer and set off the explosion;
- The technical information sheet should have a clear warning to explain that hammering of the projectile can exert enough force to compress the spring and initiate the explosion.
- The impact fuse casing should display a printed reminder of the sensitivity of the device to tapping or hammering.

These recommendations have been implemented.



DANGEROUS GOODS SAFETY COMPLIANCE FOR MINES

Resources Safety is responsible for administering legislation covering mines safety and dangerous goods safety. Where the *Dangerous Goods Safety Act 2004* applies at a mine, it applies in addition to the *Mines Safety and Inspection Act 1994*. For dangerous goods, the dangerous goods safety legislation generally takes precedence.

While the mines safety legislation covers occupational safety and health, the key focus of the dangerous goods safety legislation is the duty to minimise risk from dangerous goods, including consideration of public safety and the environment.

Some major aspects of the dangerous goods safety legislation that apply to most mine sites are summarised below, and managers should check that their site complies.

EMERGENCY PLANNING

Any site that has a dangerous goods licence is required to have a dangerous goods emergency plan. This plan needs to comply with the requirements of Resources Safety's *Dangerous goods sites – emergency planning code*, available from the dangerous

goods publications section of the Resources Safety website.

The emergency planning code is a prescribed document under the dangerous goods safety regulations — in other words, it is mandatory to comply with it.

As you would expect, the mine site emergency plan usually addresses dangerous goods incidents and it should be sufficient for the dangerous goods emergencies to be incorporated into the existing mine site emergency plan. So it is important to confirm that your site's emergency plan does, in fact, comply with the dangerous goods safety legislation by ensuring all the requirements of the emergency planning code are addressed and incorporated in the plan.

INCIDENT REPORTING

Certain incidents at mine sites that involve dangerous goods are reportable to the Chief Dangerous Goods Officer, such as fires, explosions, injury, spills, leaks and near misses caused by dangerous goods — including explosives. Some may also be reportable under the mines safety and other legislation (e.g. environmental protection).

To assist in meeting incident reporting requirements, a dangerous goods incident reporting guideline and form are

TIGHT GAS AT WARRO

Drilling on Western Australia's first tight gas project has commenced at the Warro field, about 60 km east of Jurien. Tight gas is found in low permeability rock and requires a specialist technical approach and equipment for economic extraction.

The Warro field has the potential to provide more than ten per cent of the State's current gas consumption, and there are several other formations in the Perth Basin with development potential. The Warro field is relatively close to the main transmission pipelines and if the initial drilling project is successful, a feeder line will be constructed to link the development to the domestic gas supply. Western Australia has the most energy intensive economy in Australia and natural gas makes up half of its energy supply.

With other new developments such as geothermal energy, tight gas provides a genuine supply alternative for the domestic market.

GEOTHERMAL APPLICATIONS

1st Geothermal Release



GEOTHERMAL EXPLORATION UNDERWAY IN WA

Harnessing geothermal energy in the Perth Basin is one step closer with the announcement earlier this year of the preferred applicants for geothermal exploration by Mines and Petroleum Minister Norman Moore.

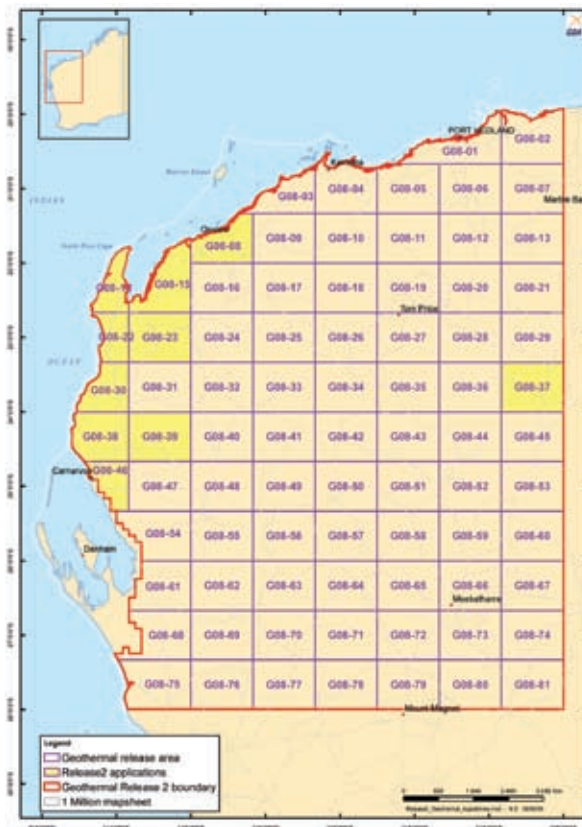
This heralds the start of a new industry that has the potential to reap benefits for the economy of the State.

This industry can provide clean energy to the State's electricity network and offer innovative solutions for companies to meet their own power requirements. Harnessing geothermal energy for heating, air conditioning and power generation is a growing industry and certainly supports the State's overall policy for clean energy development.

The Carnarvon Basin is also being considered, with applications recently closed for this second geothermal acreage release. Geothermal energy produced in these areas could be used to power mining, petroleum and other industrial operations, including ports and infrastructure.

GEOTHERMAL APPLICATIONS

2nd Geothermal Release



GUIDING HAND FOR DANGEROUS GOODS

The dangerous goods publications section of the Resources Safety website contains guidance material that may assist those in the mining industry who deal with dangerous goods, including explosives.

.....
Codes and codes of practice provide safety instructions and recommendations. Depending on the topic, they may also cover security related to explosives and security risk substances, such as ammonium nitrate.

Guidelines provide safety and, where relevant, security advice.

Guidance notes contain regulatory information and requirements — but not detailed information about the licence process.

Information sheets are ‘mud maps’ to regulatory information and may include licensing information and definitions.

Licence application forms include detailed information on the licensing requirements and process.

GUIDANCE NOTES

Several guidance notes have been released recently that may be applicable to mining operations or their service providers.

Storage and Handling

- Licensing and exemptions for storage and handling of dangerous goods

Major Hazard Facilities

- Generating the supporting documentation for an MHF safety report

Explosives

- Transport of explosives on roads and at mines
- Route restrictions for transport of explosives
- Storage of explosives
- Disposal of unwanted or abandoned explosives

Road and Rail Transport

- Dangerous goods transport documents
- Safety equipment for road vehicles
- Road transport in receptacles of more than 500 L or kg
- Road transport in receptacles of 500 L or kg or less
- Route selection, vehicle stopping and bulk transfer

Goods in Port

- Handling ammonium nitrate at a special berth



CATALOGUE OF EFORMS GROWS

Resources Safety has undertaken to produce online licensing, application, notification and other forms as electronic PDF files (eForms), providing a more convenient way to complete, submit and save forms. All that is required to use these forms is Adobe Acrobat Reader, which may be downloaded free from the Adobe website.

.....

A useful feature of eForms is the in-built error checking, which helps in correct completion of the forms and maintains the quality of the data. With earlier 'static' versions of the forms, it was relatively easy for people to overlook filling in items of essential information.

For example, a random sample of 100 mining injury report forms for August 2008 required 108 phone calls and emails to follow up incomplete or missing data. After introduction of the eForm, another random sample of 100 forms generated only 12 follow-up queries, most related to clarification of data (e.g. confirming significant changes in employee numbers).

As another example, in October 2008, Resources Safety entered 926 CONTAM sample record sheets into the CONTAM database – but, before the data could be entered, some 196 enquiries had to be made due to forms that were incomplete, incorrect or needing clarification. In many cases, the sites had to re-submit corrected forms. The new eForms should reduce the number of requests from Resources Safety for additional information.

The following eForms are now available in the mining forms section of the Resources Safety website:

- freedom of information (FOI) application for access to documents
- biological monitoring results form
- CONTAM system registered sampler form and sample record sheet
- personal noise exposure
- exploration operation notification
- safety and health representative(s) notification of election form.

Where deemed useful, online guides have been prepared to assist in using the enhanced PDF forms. Currently, guides are available covering the notification of election for safety and health representatives and sample record sheet for the CONTAM system.

Submission of accident and incident reports is also done via eForms, but these are not available online. Instead, together with relevant guides, they are sent directly to mining operations by the AXTAT manager (axtatmanager@dmp.wa.gov.au).

The remaining occupational health and mines safety forms, as well as those for certificates of competency, mutual recognition and dangerous goods licensing are in the eForms production schedule. As they are approved, their online availability will be publicised in *MineSafe*.



NAVIGATING THE WEB

MINES SAFETY

Act and regulations

Hardcopies of the *Mines Safety and Inspection Act 2004* and *Mines Safety and Inspection Regulations 1995* are only available from the State Law Publisher. However, electronic copies of the Act and regulations can be downloaded from the State Law Publisher's website at no cost. The links are located under "Legislation and policy". The mining safety and health section also contains a list of general exemptions from the provisions of the regulations, as well as information on reviews and reports related to mines safety.

Guidance materials

The resources provided in "Safety guidance and FAQs" have been prepared to assist companies and individuals to understand the requirements of the legislation applying to mines safety. They include codes of practice, templates, guidelines, minerals industry safety handbook, Mines Safety Matters pamphlets, posters, reports and toolbox presentations.

Common queries dealing with bullying and violence, the election of safety and health representatives, English language requirements for high risk duties and resolving safety and health issues are addressed in the FAQs section.

Occupational health

The occupational health topics covered under "Occupational health" have been developed to assist companies and individuals to promote and improve the safety and health of

employees engaged in mining operations. Topics include asbestos, hazardous substances and contaminant monitoring, hazardous manual tasks, health surveillance and biological monitoring, noise control in mines and radiation safety.

Safety and health representatives

"Safety and health representatives" provides information on the role and responsibilities of representatives, investigating incidents, safety and health consultative mechanisms and procedures, provisional improvement notices (PINs), the election process and more.

Registration of classified plant

The registration of classified plant generates numerous enquiries and these are dealt with in a dedicated section under "Certificates, licensing and registration".

Certificates of competency

"Certificates, licensing and registration" contains information about certificates of competency for mine surveyors, quarry managers, mine managers, underground supervisors and mutual recognition. There is also information about Resources Safety's Board of Examiners, applying for a certificate of competency, and examination dates and locations.

Accidents and incidents

Information about reporting or investigating an accident or incident on a mining operation, including AXAT forms, databases and statistics, is located under "Accidents and incidents".



The mining section also contains the latest significant incident report and safety bulletin, with related links (located on the right-hand side) leading to the full archives of reports and bulletins.

Application and notification forms

Mining safety and health application and notification forms, such as certificates of competency, CONTAM and safety and health representative elections, as well as a pro forma for a PIN are available under “Forms, fees and charges”.

DANGEROUS GOODS SAFETY

Act and regulations

Hardcopies of the *Dangerous Goods Safety Act 2004* and accompanying suite of Dangerous Goods Safety Regulations 2007 are only available from the State Law Publisher. Links to free downloadable copies from the State Law Publisher’s website are located under “Legislation and policy”.

Licensing and compliance

Dangerous goods application and notification forms and the schedule of fees and charges are available under “Forms, fees and charges”.

Guidance materials

The resources provided under “Safety guidance and FAQs” have been prepared to assist companies and individuals to understand the requirements of the regulations relating to the safe storage, handling and transport of dangerous goods,

including major hazard facilities, explosives, fireworks and special berths, and security aspects of goods deemed to be ‘security risk substances’. They include codes of practice, templates, guidelines and a list of approved consultants.

Common queries dealing with dangerous goods safety and security, and how the legislation works, are addressed in the FAQs section. Currently, most answers are in the form of information sheets.

Dangerous goods security cards

The application form for a dangerous good security card is only available from participating Australia Post Offices. Ring 13 13 18 for participating offices. Guidance on applying for a Dangerous Goods Security Card can be found in the FAQs section under “Safety guidance and FAQs” and also under “Forms, fees and charges”.

Major hazard facilities

Dangerous goods safety for Western Australian major hazard facilities is regulated and case managed by Resources Safety. In addition to storage and handling guidance, detailed guidance material on classification as a major hazard facility and developing a safety report is available under “Safety guidance and FAQs” in the dangerous goods safety section.

Accidents and incidents

Annual incident logs for dangerous goods as well as a guideline and form for reporting so-called reportable situations are located under “Accidents and incidents”.

LATEST WA MINING SAFETY PERFORMANCE FIGURES RELEASED

Did you know that Western Australia's mining workforce increased by nine per cent over 2007-08, but the lost time injury (LTI) frequency rate improved by 14 per cent?

According to statistics recorded by Resources Safety's AXTAT database, there has been a slight but continuing improvement in the State's overall safety performance.

You can read about these statistics and more in the recently released *Safety Performance in the Western Australian Mineral Industry – Accident and Injury Statistics 2007-2008*. The publication is an annual compilation mainly relating to accidents between July 2007 and June 2008 involving time lost from work of one day or more on Western Australian mines.

The 66,183 employees in the mining industry during 2007-08 worked a total of 134.04 million hours. Key industry statistics relating to those employees are outlined below.

The full compilation of 2007-08 statistics is available from the Resources Safety website under mining accidents and incidents. Hardcopies can be obtained by contacting the publications team at Resources Safety (ph. 08 9358 8154, RSDcomms@dmp.wa.gov.au).

FATAL ACCIDENTS

There were two fatal accidents in the Western Australian minerals industry during 2007-08.

Of 16 fatalities that have occurred in the mining sector over the last five years, seven have been underground and nine occurred in surface operations.

The overall fatal injury incidence rate has continued to decrease since 2005-06. In 2007-08, there were 0.03 fatalities per thousand employees, which is still a concern to Resources Safety.

Resources Safety maintains the view that no fatal accident is acceptable, and a fatal injury incidence rate of zero is achievable and sustainable.

SERIOUS INJURIES

There were 331 serious injuries reported in the mining industry for 2007-08.

The latest figure has decreased since 2006-07, when 348 serious injuries were recorded. Statistics also show that the overall serious injury frequency rate (number of serious injuries per million hours worked) improved by 11 per cent over the last year.

Of the 2007-08 injuries, 324 were sustained in metalliferous mines and seven in coal mines.

Of the major mining sectors, coal had the highest five-year average serious incidence rate (number of lost time injuries per thousand employees for a 12 month period), at 12.7, and iron ore the lowest at 3.6.

DID YOU KNOW?

- Injuries to legs accounted for the largest proportion of serious injuries in underground mines at 19 per cent, and in surface mining it was injuries to arms at 22 per cent.
- Sprain or strain represented the highest proportion by nature of injury in both underground (35 per cent) and surface mines (46 per cent).
- The most common accident type associated with serious injuries underground (29 per cent) and on surface (32 per cent) was over-exertion or strenuous movements.

LOST TIME INJURIES

In 2007-08, 19,365 days were lost through occupational injuries on mines in Western Australia.

There were 435 lost time injuries (LTIs) in the State's mining industry. Of those, 422 were in metalliferous mines and 13 in coal mines. In addition to these initial injuries, there were 53 recurrences of previous injuries, resulting in 1215 work days lost over the last financial year.

LTI FREQUENCY RATES DURING 2007-08

- Iron ore — improved by ten per cent, falling from 2.0 to 1.8.
- Bauxite and alumina — improved by seven per cent, falling from 4.1 to 3.8.
- Gold — improved by 26 per cent, falling from 4.3 to 3.2.
- Nickel — improved by eight per cent, falling from 2.5 to 2.3.

INJURIES BY MINERAL MINED DURING 2007-08

Mineral mined	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Iron ore	18,926	69	3.6	1.8	16.9	30	1,163
Gold	14,043	95	6.8	3.2	26.7	85	2,532
Nickel	13,030	59	4.5	2.3	18.4	42	1,083
Bauxite and alumina	8,268	60	7.3	3.8	17.3	66	1,037
Mineral sands	2,696	18	6.7	3.8	30.4	116	547
Base metals	2,383	41	17.2	8.2	23.9	195	981
Diamonds	2,091	16	7.7	3.1	13.6	42	217
Coal	860	13	15.1	10.2	12.5	128	162
Salt	843	8	9.5	5.8	14.4	83	115
Construction materials	575	10	17.4	8.2	23.7	194	237
Tin, tantalum and lithium	464	4	8.6	3.6	11.5	41	46
Other	2,004	42	21.0	11.5	15.4	178	648
TOTAL MINING	66,183	435	6.6	3.2	20.2	65	8,768

NOTE: Duration in Tables 4 and 5 does not take into consideration time lost after 30 June 2008 by persons still off work at the end of the fiscal year, time lost from recurrent injuries, or time lost by persons with carry-over injuries from before July 2007.

DISABLING INJURIES

Disabling injuries are those resulting in the person being unable to perform his or her regular job any time after the day or shift on which the injury occurred, regardless of whether or not the person is rostered to work, and where alternative or light duties are performed or hours are restricted.

In addition to the 435 LTIs during 2007-08, there were 731 disabling injuries reported, which is a slight increase than the previous year, when 705 were reported. So the total number of reportable injuries for 2007-08 was 1166.

For the disabling injuries, 717 were sustained in metalliferous mines and 14 in coal mines. Of these, 432 resulted in the person being disabled for two weeks or more.

DID YOU KNOW?

- The highest number of disabling injuries was reported for employees on gold mines, with 228 reports.
- No disabling injuries were reported for employees on tin, tantalum and lithium mines.

METALLIFEROUS MINING PERFORMANCE

The overall performance indicators for the metalliferous mining sector show an overall improvement in 2007-08 of the incidence, frequency and duration rates and injury index.

The overall incidence rate (LTIs per thousand employees) improved by 13 per cent, falling from 7.5 in 2006-07 to 6.5 in 2007-08.

The overall frequency rate (LTIs per million hours worked) improved by 11 per cent, falling from 3.6 in 2006-07 to 3.2 in 2007-08.

The overall duration rate (average number of workdays lost per injury) improved in 2007-08 by slightly less than one per cent, falling to 20.4.

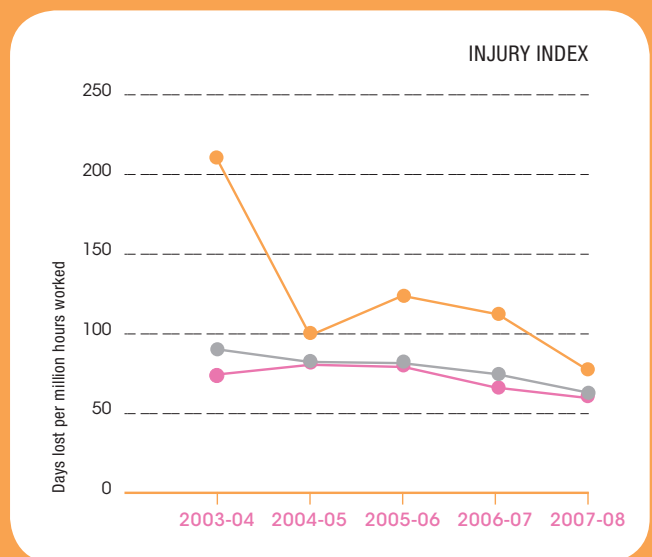
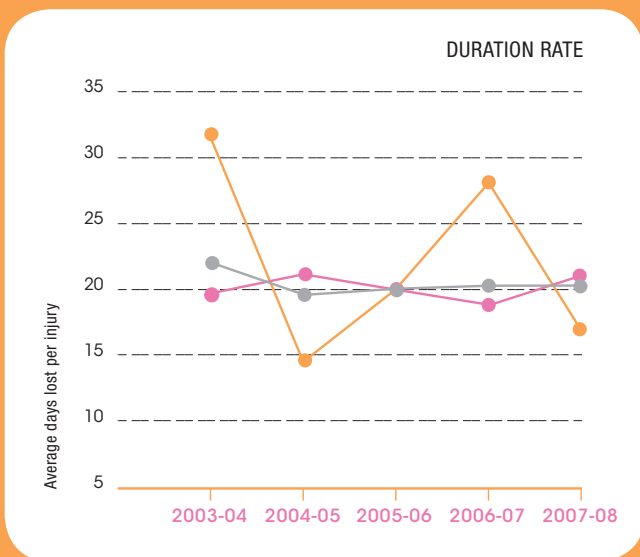
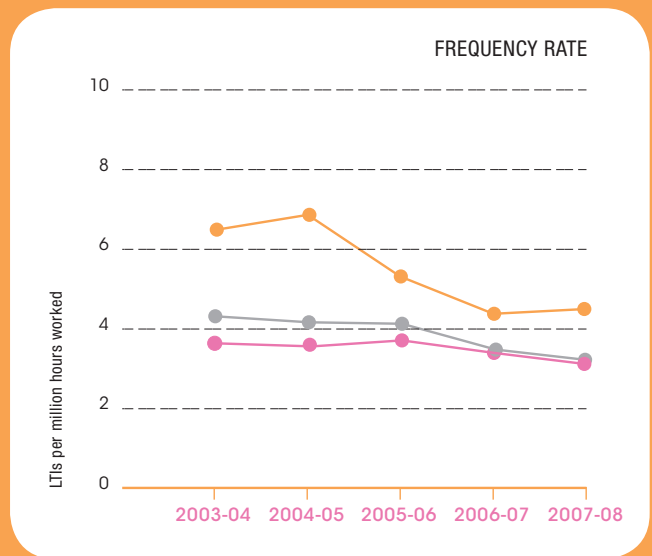
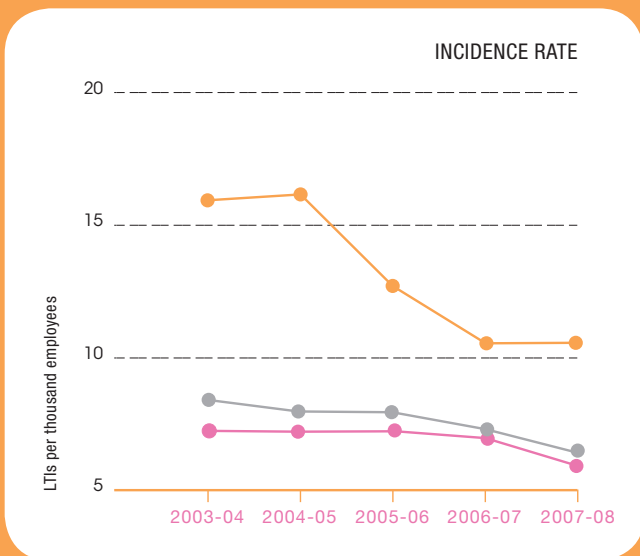
The decrease in both frequency and duration rates resulted in an overall improvement of 12 per cent to the injury index (number of workdays lost per million hours worked), which fell from 74 to 65.

EXPLORATION PERFORMANCE

The recent and past editions of *Safety Performance in the Western Australian Mineral Industry* have not reported injury statistics for exploration activities away from mines sites or on exploration leases. However, the *Mines Safety and Inspection Act 1994* was amended recently to clarify provisions that deal with the duties of exploration managers, including the requirement to report injuries. So the compilation for 2008-09 will include injury statistics for the exploration sector.



METALLIFEROUS PERFORMANCE INDICATORS 2003-04 TO 2007-08



MINERS URGED TO CONSIDER SAFETY CASE REGIME

Western Australia's new Director of Mines Safety with Resources Safety says the State's mining sector must debate the merits of adopting a safety case regime similar to that operating in the oil and gas sector. Simon Ridge spoke at the Chamber of Minerals and Energy of Western Australia's (CME) annual occupational health and safety conference, *Raising the Bar*, held in Perth in March.

Under the safety case regime, legislation is used to define broad safety objectives, an operator develops methods of managing risk, and the regulator assesses these methods.

The approach was developed in the North American nuclear industry 40 years ago, and is currently applied to about 20 major hazard facilities in Western Australia regulated by Resources Safety. The onshore oil and gas sector also operates under a safety case regime, with technical assessments and reviews undertaken by Resources Safety.

Mr Ridge said the safety case regime had been suggested as a mechanism to ensure the continuing improvement of occupational health and safety in the State's mining industry. He said it could be utilised to increase managerial flexibility regarding health and safety, comply with the Government's desire to reduce prescriptive regulation, and provide more freedom for innovative practices.

Mr Ridge said that, until now, it has been difficult to quantify the benefits of safety cases.

"Everybody feels it's a good thing and there is no doubt that if you know more about your hazards, the risks associated with

those hazards and the mechanisms for managing those risks, then there has to be a benefit," Mr Ridge said.

He said the Government was not looking to force the system on the mining sector.

"The industry and Government, and employees themselves, have to decide if the benefits are there," Mr Ridge said.

"The fact of the matter is there has to be a consensus, there has to be a benefit for the industry, and the pathway forward needs to be discussed. We are convinced that the benefits are there but we must have that debate."

The benefits also needed to be weighed against the significant time and cost of establishing and maintaining a safety case, which was estimated to be the equivalent of three man years in some cases.

Mr Ridge outlined several concepts within the safety case regime that were applicable to mining operations. These included an in-depth hazard identification process, an in-depth risk assessment process, and the implementation of comprehensive measures to manage on-site risks.

He stressed that any safety case regime for mining would be tailored, and not a straight copy of the oil and gas regime.

"Firstly, we must remember that most mines are not major hazard facilities," Mr Ridge said.

"The mine infrastructure is constantly changing and is created within an inhomogeneous material, rock. This in itself may make many of the risk assessment tools and databases that the established safety case relies upon hard or impossible to



“

THE FACT OF THE MATTER IS THERE HAS TO BE A CONSENSUS, THERE HAS TO BE A BENEFIT FOR THE INDUSTRY, AND THE PATHWAY FORWARD NEEDS TO BE DISCUSSED. WE ARE CONVINCED THAT THE BENEFITS ARE THERE BUT WE MUST HAVE THAT DEBATE

”

SIMON RIDGE

apply. In such cases, a heavy reliance upon qualitative rather than quantitative risk assessments may ensue.”

Also speaking at the CME conference, Mines and Petroleum Minister Norman Moore called safety in the resources industry his number one priority.

He said Western Australia had experienced significant changes since the 1950s in its approach to workplace safety, but there was a long way to go before it had a working environment in which safety was absolutely paramount.

Mr Moore spoke at length about the safety regime governing the State’s uranium sector, which has been revived by the new Government overturning the previous establishment’s ban on extracting the metal.

“The Mines Safety and Inspection Regulations 1995 already regulate radiation safety in the mining industry and the processing of radioactive material,” Mr Moore said. “This includes requirements for such things as radiation management plans, the appointment of radiation safety officers and the control of exposure to radiation.”

“With the recent release of new safety guidelines for radiation and the comprehensive regulations already in place, Western Australia is already well prepared to take the uranium industry forward.”

He said Resources Safety already provided radiation safety inspections and advice in relation to the State’s existing and proposed mineral sands mines.

“On top of this, we are discussing with the South Australian and Northern Territory Governments about how they regulate

their uranium industries,” Mr Moore said.

“The State Government will ensure that the highest environmental, occupational health and safety and transport standards will apply to any proposal to mine and export uranium in this State — anything else is not acceptable.”

Behavioural safety specialist Corrie Pitzer told the *Raising the Bar* audience that they shouldn’t rely on regulation to protect themselves or their workers.

Mr Pitzer, the chief executive of Canada’s SAFEmap International, said there was a ‘sigmoid curve’ effect regarding workplace safety, whereby it increased with the level of compliance and conformity with regulations up to a point, but then started to drop.

“As we do all these things so rigidly and so correctly, we are losing our human ability to see what’s wrong and to adapt to it,” he said.

Mr Pitzer said risk was not something that could always be controlled.

“We have to develop the competence within people that allows them to adapt to changing situations,” he said.

Businesses also needed to move away from an approach to safety that focused too much on numbers, specifically zero, in terms of lost time injuries or deaths.

“We have to get away from the numbers game to a situation where we make decisions at every level of an organisation that are based on our values related to safety — that should be our end goal,” Mr Pitzer said.

ASSESSING HEALTH

The Mines Safety and Inspection Regulations 1995 require employers to arrange for an initial health assessment to be completed for all new employees within three months of employment and then, subsequently, within five years from the previous assessment, as long as an employee continues working in the Western Australian mining industry.

Over the past ten years, the average annual workforce for the industry (including all mines and exploration companies) has ranged from about 41,000 to 68,000 employees, with a monthly peak in October 2008 of 78,000.

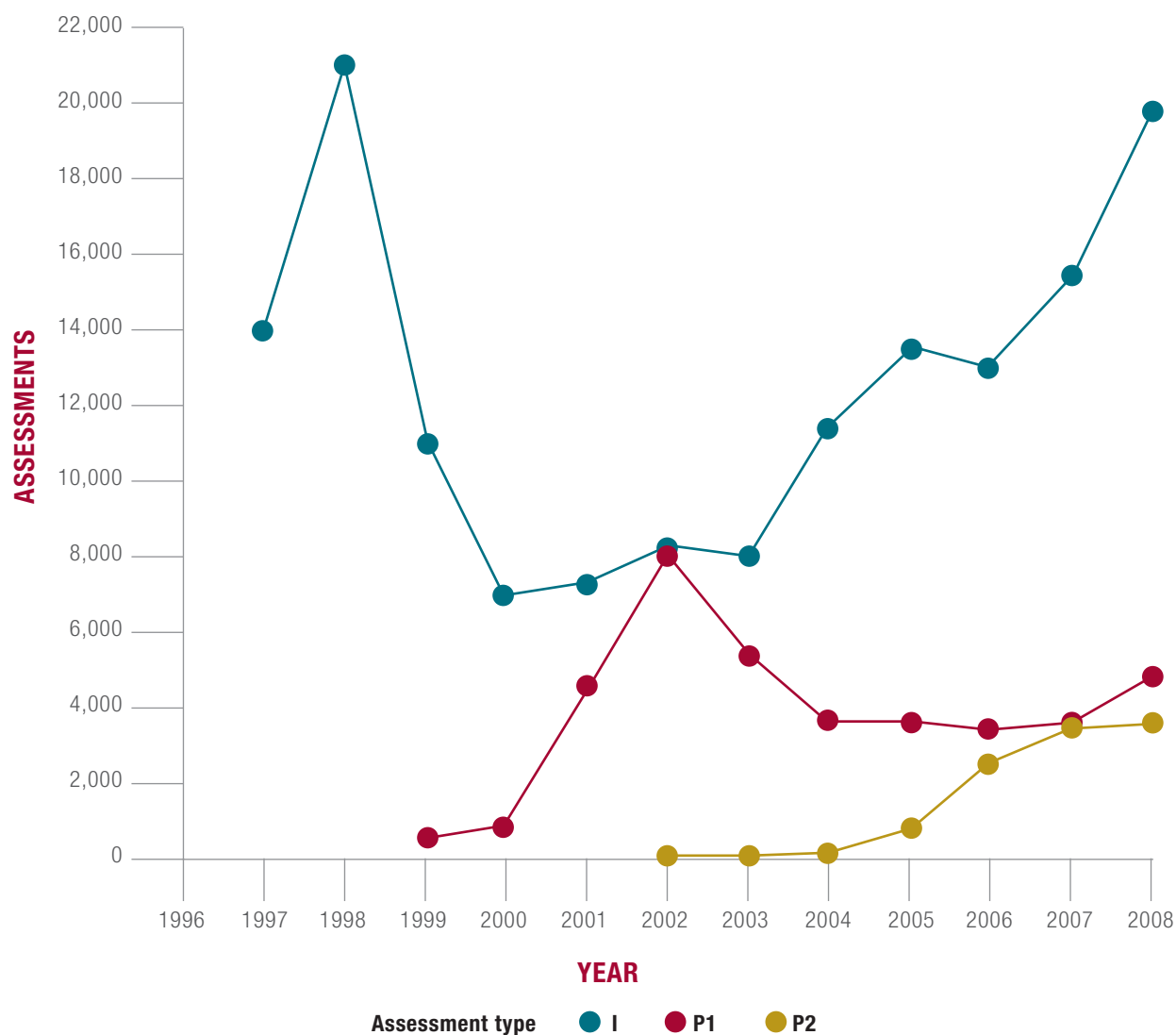
By March 2009, over 200,000 health assessments had been entered into the MineHealth database. Of those, 154,563 employees have had initial (I) health assessments, 37,488 have had two assessments (P1) and 9,752 have had three (P2).

The high number of initial health assessments compared to the average annual workforce figures and numbers of subsequent assessments suggests that there are many new starters who leave the industry within five years.

If you have not yet had an initial health assessment or it has been five years or more since your last assessment, talk to your employer about arranging one.

More information on health surveillance and the MineHealth system is available on the Resources Safety website in the occupational health section.

MINEHEALTH - NUMBER OF ASSESSMENTS BY YEAR AND ASSESSMENT TYPE

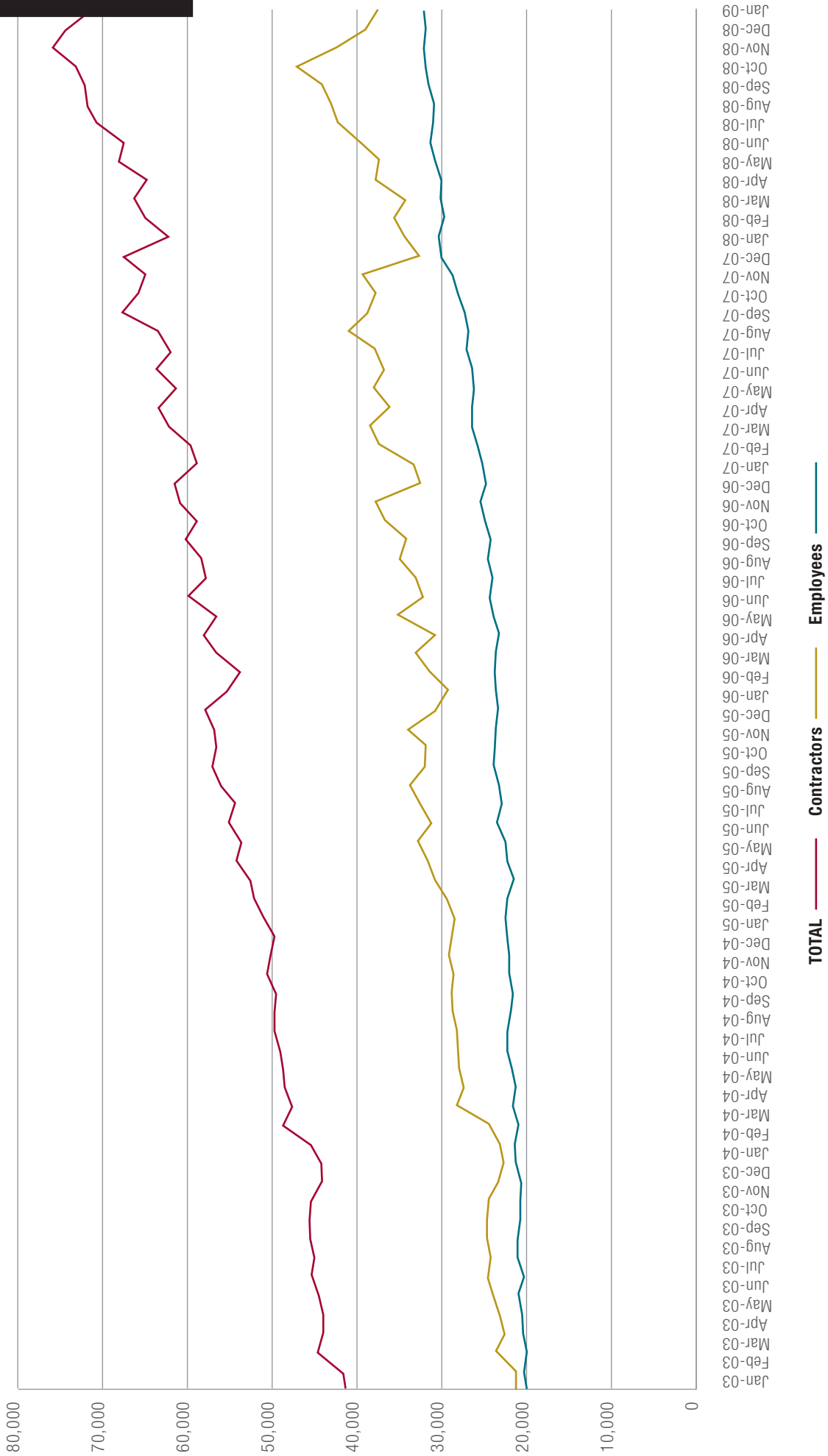


ASSESSMENT TYPE

ASSESSMENT TYPE	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
INITIAL (I)	13,856	21,133	10,875	5,805	6,771	7,262	8,202	7,906	11,232	13,397	13,120	15,403	19,601
FIRST PERIODIC (P1)	-	-	-	80	486	4,781	8,063	5,336	3,751	3,718	3,217	3,600	4,456
SECOND PERIODIC (P2)	-	-	-	-	-	-	1	14	55	773	2,341	3,248	3,320
TOTAL	13,856	21,133	10,875	5,885	7,257	12,043	16,266	13,256	15,038	17,888	18,678	22,251	27,377

CRUNCHING THE NUMBERS

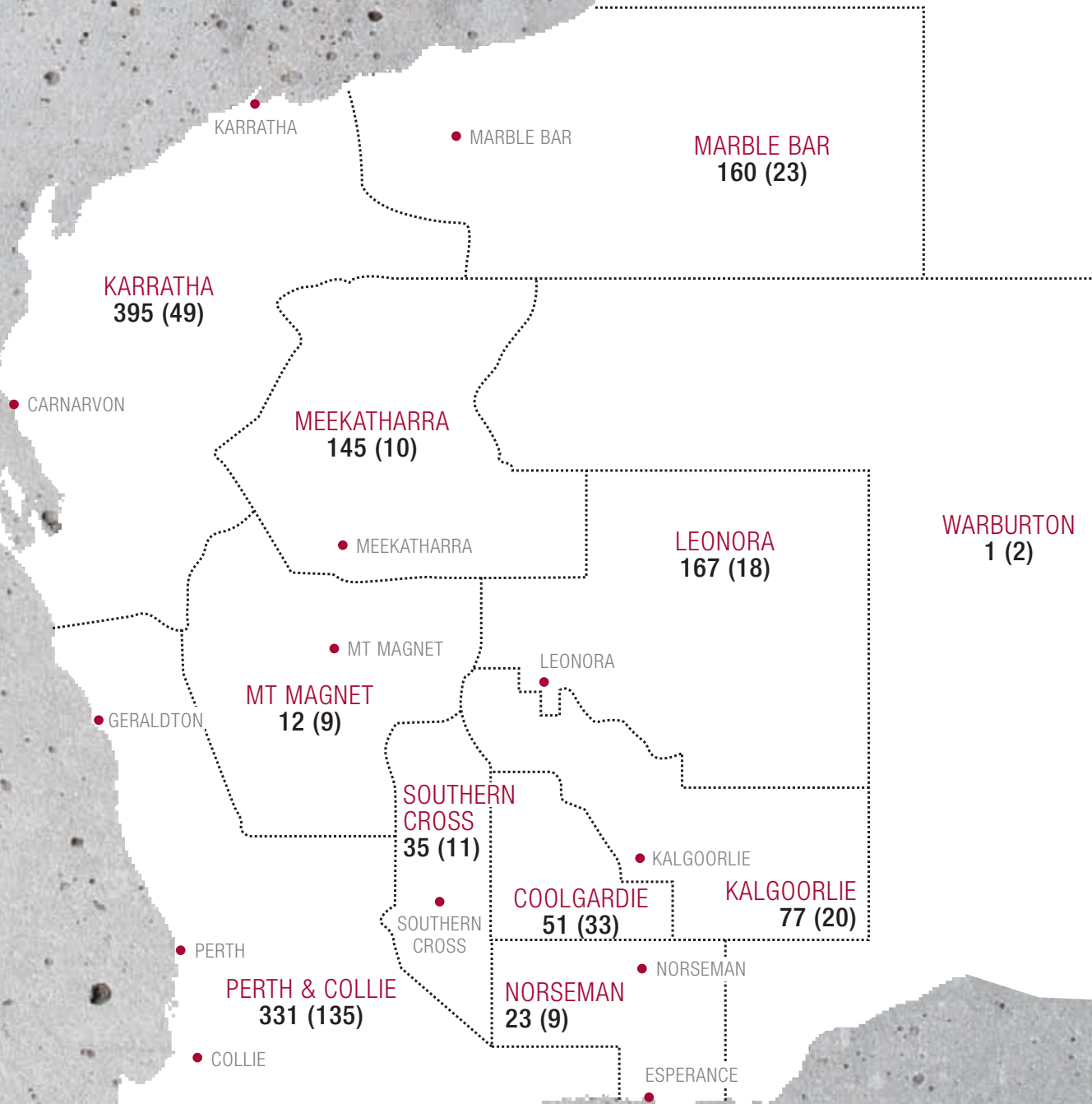
MONTHLY MINING WORKFORCE



WHERE ARE THEY?

DISTRIBUTION OF SAFETY & HEALTH REPRESENTATIVES AS AT 12 MARCH 2009

- Mining registrars administration boundary
- MARBLE BAR** Administration region
- 160 (23)** Number of SHRs (Number of mine sites)
- Town/city



Total active mine sites = 353
 Total SHRs = 1,576
 SHRs attached to mine sites = 1,482
 Others (e.g. exploration) = 94



JOHN FARROW



JOCK WATSON



BOB LEGGERINI

KEEPING INFORMED

Safety and health representatives play a key role in the promotion of safe work practices within the minerals industry. Resources Safety has a variety of resources available to support safety and health representatives — both in person and online.

.....
The following employee's inspectors are available to answer specific queries from safety and health representatives:

COLLIE AND KARRATHA – John Farrow
Phone: 08 9734 1222 Email: john.farrow@dmp.wa.gov.au

KALGOORLIE – Jock Watson
Phone: 08 9026 3200 Email: jock.watson@dmp.wa.gov.au

PERTH – Bob Leggerini
Phone: 08 9358 8486 Email: bob.leggerini@dmp.wa.gov.au

Some useful online resources available on the Resources Safety website are described below.

Safety and Health Representatives

This dedicated area brings together information to assist safety and health representatives with their role.

Safety Guidance and FAQs > Mining Safety and Health

There is extensive occupational safety and health information, including publications, *MineSafe* magazine, pamphlets, posters and toolbox presentations.

Safety Guidance and FAQs > FAQs

The topics about resolving safety and health issues, and bullying and violence may be of particular interest to safety and health representatives.

The occupational safety and health section of the Chamber of Minerals and Energy of Western Australia's website at www.cmewa.com also has a variety of useful information, including:

- A report on a taxonomy study commissioned by the Chamber on fatalities in the Western Australian mining industry during the period 1970-2006. It can be used for developing initiatives and programs, identifying existing training and management gaps, and induction and training purposes.
- *Working Hours 2007*, a publication utilising industry data collected by the Chamber since 2003 to illustrate a range of working hour issues.
- *First Watch*, bimonthly newsletters that promote and circulate information about positive safety initiatives occurring throughout industry.

If you are unable to access the internet, contact Tse Yin Chang (ph. 08 9358 8178, mineshreps@dmp.wa.gov.au) to request a list of Resources Safety publications and toolbox presentations that may be ordered. She should also be contacted if there have been any changes to your status as a safety and health representative.

Use the poster on the right to let people know who their safety and health representative is.



Your safety and health representative is...

NAME:

CONTACT DETAILS:

SHIFT / AREA:





SH

GETTING THROUGH THE BARRIERS

During a round-table discussion on the Kalgoorlie leg of the 2008 Mines Safety Roadshow, Tara Morris of The TKM Institute (www.thetkminstitute.com.au) related one of her strategies for raising safety awareness with employees. She kindly agreed to share the activity with MineSafe readers.

.....
Lecturing employees about safety is one thing but being able to interest and engage employees in safety can be quite another.

Knowledge and experience of a site hold the key to establishing what workplace safety culture and attitudes exist — and their impact on safety awareness — and highlighting room for improvement. This information can be used to find new and interesting ways to communicate safety messages to employees so they can relate to, understand and retain the information presented to them.

One site visit inspired a series of presentations to effectively address gaps within the site's safety culture, and specifically the duty of care requirements. An investigation of a recent near-miss revealed employees were not considering the task as a whole, only their part in it.

A presentation was written for each crew based on its particular dynamics. Initially, crew members were asked who

was responsible for their health and safety. All employees indicated themselves. Then a specific person was named and the crew asked who was responsible for that person's health and safety — all crews restated the person's name. This further evidenced that employees were not aware that they also had a responsibility for each other's health and safety at work.

Duty of care was then explained and a scenario outlined, such as a forklift colliding with a rock or a welding-electrocution incident, which resulted in serious and permanent harm.

After each scenario, the crews were asked how they felt. Long initial silent pauses and close examinations of the floor clearly showed they were affected. And so the simple question was asked — what could have been done to prevent the incident? Many people spoke up and offered good suggestions, which showed that as soon as employees were aware of a hazard they knew the controls.

The final message to each of the crews was to remember to look after one another, consider what others are doing around you, and how your actions can affect them.

The presentations were well received, with employees saying the information had a high level of impact, was easy to understand and straight to the point. More importantly, subsequent evidence has shown that the new information is being taken onboard and applied to the workplace.



Photo courtesy Tara Morris

“SEEING A NEW SAFETY SYSTEM BEING IMPLEMENTED, RESULTING IN A SAFER AND MORE POSITIVE WORK ENVIRONMENT, GAVE ME A SENSE OF PRIDE”

TARA'S JOURNEY TO SAFETY TRAINING

I had a somewhat comical introduction to safety. I was six months into my first full time job, employed as a graduate, sitting next to the State Manager at a new safety induction. I remember, in all seriousness, asking him what a “mobile plant” was — I had a vision of a potted palm on wheels. He laughed and thought I was joking then asked me if I was interested in safety. Pondering his question, I decided it would probably be an enjoyable challenge to, firstly, learn about an area I wasn't familiar with and, secondly, convince others to take an interest in safety because it is so important.

My first experiences in safety training were more positive than I expected. I had prepared myself for resistance to safety initiatives and figured most of the predominately male employees would dismiss me as a blonde female in skirt and heels, thinking I knew nothing. However, my background with a public relations, journalism and marketing degree helped as I used these skills to develop a rapport with the guys — I learnt their names, asked them questions and sought their input.

These good working relationships went a long way towards developing an independent safety culture in the workplace — mostly by involving employees in the process, respecting their ideas and avoiding the stereotypical ‘dictator’ safety officer approach.

Seeing a new safety system being implemented, resulting in a safer and more positive work environment, gave me a sense of pride, knowing it is rare to easily gain compliance with a broad range of generations. Sometimes new young employees are “too cool” to do things the safe way, whereas others “have been doing it this way for 25 years”. Communication is so important and does make a difference.

Inspired by this and other successes, I went on to get a Diploma of Training and Assessment, Certificate IV in Occupational Safety and Health and Frontline Management. I also realised an opportunity to start my own registered training organisation to provide training to organisations and individuals, helping them develop safety cultures at workplaces by engaging employees.

SAFETY AND HEALTH AWARDS



MINING INSTITUTE HEALTH AND SAFETY AWARD RECOGNISES LEADERSHIP AND COMMITMENT

The Chief Operating Officer of North Queensland Xstrata Copper, Steve de Kruijff, has won The AusIMM (Australasian Institute of Mining and Metallurgy) Jim Torlach Health and Safety Award for 2008.

The prestigious AusIMM Annual Awards recognise professional excellence across a range of categories. AusIMM Chief Executive Michael Catchpole said The Jim Torlach Health and Safety Award recognised best practice and raised awareness of what could be done in the mining industry.

“Steve de Kruijff is a man who is passionate about the safety of his people, and has applied that passion to ensure that organisational safety goals are implemented consistently and successfully at the operational level,” Mr Catchpole said.

Under Mr de Kruijff’s leadership as General Manager of the Mount Isa Copper Operations (MICO) within Xstrata Copper’s North Queensland division, a range of innovative safety systems were implemented, commencing in early 2005. Some of these initiatives include:

- the re-organisation of the safety and health functions and increases in the resources committed to training to provide more effective and focused competency based training outcomes;
- an inclusive safety communication and improvement system that materially increased the workers and managers’ focus on the hazards present in day-to-day activities;
- leadership development programs aimed at front line leaders that delivered strengthened coaching and communication skills; and
- a two-year study focused on ‘over period of time’ injuries in key underground mining roles that identified opportunities to make lasting improvements to equipment and task design.

Between early 2005 and late 2006, these safety initiatives helped deliver MICO a dramatic improvement in the disabling injury frequency rate moving average from 34 to 7.

In late 2006, Mr de Kruijff was promoted to the position of Chief Operating Officer for Xstrata Copper’s North Queensland division. Steve is also currently Vice President of the Queensland Resources Council.

“The leadership and passion Steve de Kruijff applies to the health and safety of workers in the industry continues to deliver results,” said Mr Catchpole.

Xstrata Copper’s North Queensland division achieved more than 3,300,000 million hours lost time injury (LTI) free between October 2008 and February 2009 — a period that was still continuing at the time of the AusIMM Awards in March. In 2008, the division also achieved a 36% improvement in its total recordable injury frequency rate compared to 2007.

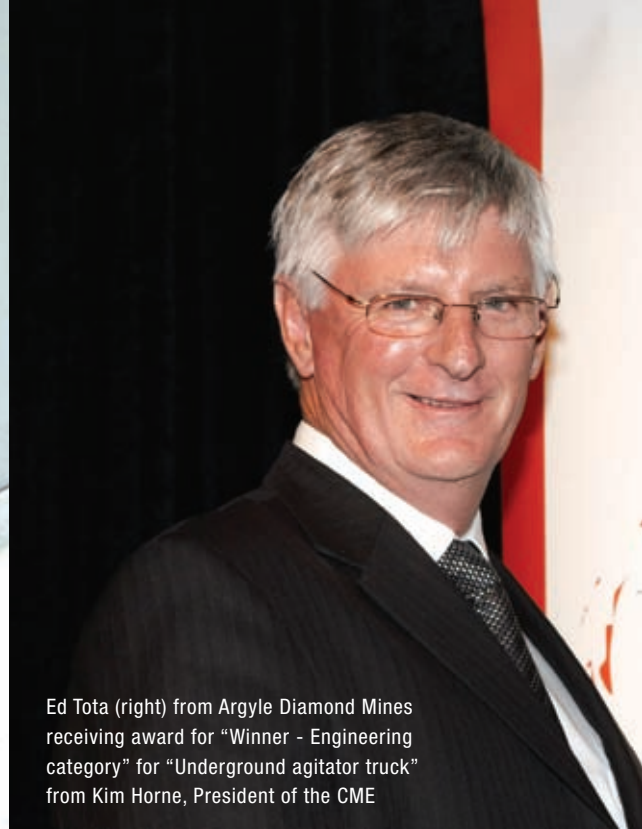
JIM TORLACH

James (Jim) Milne Torlach (1938-2006) made an outstanding contribution to the improvement of safety and health in the Western Australian mining industry, being responsible for the complete overhaul and modernisation of mines safety legislation, culminating in the passage of the *Mines Safety and Inspection Act 1994*. He was the State Mining Engineer from 1984 to 2001.

SAFETY AND HEALTH AWARDS



Alcoa's "Element remover for dust collector", winner of the "People category" award



Ed Tota (right) from Argyle Diamond Mines receiving award for "Winner - Engineering category" for "Underground agitator truck" from Kim Horne, President of the CME

INNOVATIVE COMPANIES SHARE IN SAFETY AWARDS

Three major Western Australian companies have been recognised for adopting innovative approaches to safety in the resources industry.

Rio Tinto subsidiary Argyle Diamond Mines, Alcoa World Alumina Australia and Macmahon Holdings won the engineering, people and systems categories, respectively, in the Chamber of Mineral and Energy of Western Australia's (CME) 2009 Safety and Health Innovation Awards.

As well as the winners, highly commended recommendations were handed out to Iluka Resources for its shell fan removal cradle and Rio Tinto Dampier Salt for its manual tyre handler.

There were 32 submissions to the awards. CME Chief Executive Officer Reg Howard-Smith praised the entrants and winners.

"Through their participation in the CME Safety and Health Innovation Awards, individuals and work teams are demonstrating a proactive approach to making the workplace safer," he said.

"The CME Safety and Health Innovation Awards facilitate the sharing of great ideas throughout the resources sector.

"These companies are recognising potentially hazardous situations, and adopting strategies to minimise or eliminate the hazards."

Now in their fifth year, the awards recognise creativity and ingenuity in the workplace, and aim to promote their application across the Western Australian resources sector.

Argyle won its engineering award for its underground agitator trucks.

The purpose-built fleet of five vehicles was designed to eliminate hazardous parking and braking problems encountered when delivering shotcrete to the company's underground operations.

Argyle Underground project director Ed Tota said the technology was the result of combined teamwork between Hitachi, Argyle Diamonds, Macmahon and Cemex staff to develop and manufacture a custom-built agitator truck that incorporated automatic safety controls to replace the previous manual systems.

Safety technology included in the trucks include automatic park brake activation upon removal of seatbelts or door opening by the driver, and automatic electronic transmission retardation that restricted vehicle speed to 15 km per hour when manoeuvring underground.

The vehicles also include automatic application of braking systems when neutral gear is detected at ground speeds of more than 1 km per hour, and the agitator bowl is restrained with the chassis to minimise the opportunity for separation if the truck is involved in an accident.

"They are custom-built for Argyle conditions. However, the fail-safe controls engineered into this truck could certainly enhance safety at other underground mining development projects," Mr Tota said.

He said the recognition the CME award provided was very rewarding for the Argyle's workforce.



“THESE COMPANIES ARE RECOGNISING POTENTIALLY HAZARDOUS SITUATIONS, AND ADOPTING STRATEGIES TO MINIMISE OR ELIMINATE THE HAZARDS”

REG HOWARD-SMITH

“Argyle Diamonds and its parent company Rio Tinto maintain a very high standard in safety and we aim to ensure that every employee returns safely to their families at the end of each roster,” he said.

“Safety is monitored very closely through various systems and processes that identify risk areas and enable effective management.”

Alcoa’s award recognised its dust-busting tool, which eliminates wrist strain for workers when removing elements from vessels. The tool was designed by shopfloor employees and can also be used in other similar operations.

Alcoa Kwinana Refinery Ergonomist Suzanne Bannerman said the tool reduces the ergonomic effort required to remove the elements.

“This is a highly repetitive task, as the operators were required to remove up to 400 elements per vessel,” Ms Bannerman said.

“The development of the tool significantly improves the working posture and eliminates the excessive wrist force required to perform this task.”

She said the use of the tool had improved safety by significantly reducing the risk of musculoskeletal injuries associated with poor back position for operators required to reach below feet level, as well as excessive wrist strain.

“The original method to remove the elements was to insert

two hands into the top of the element, apply an outward force, below foot level and then pull up the element, which weighs about 15 kg,” Ms Bannerman said.

She said Argyle would encourage technology sharing with other companies in order to increase safety across the industry. Ms Bannerman was also pleased for Alcoa to be recognised with the CME Safety and Health Innovation Award.

“Safety plays a significant role in our operations and we are committed to the prevention of injuries in the workplace,” she said.

Macmahon’s crusher maintenance work safety system earned the company its award.

The system is an integrated suite of equipment and procedures that treats crusher shutdown as a single event from a health and safety perspective, rather than a series of individual operations.

The awards were announced as part of CME’s annual occupational health and safety conference *Raising the Bar*, held in Perth on 9-10 March.



Macmahon the “Systems category” award for its “Crusher maintenance work safety system”

EXPLORATION ROADSHOW LINKS TO INFORMATION HIGHWAY

For the past four years, Resources Safety has run the Mines Safety Roadshow series, aimed at mining operations in general. However, in mid-2008, it had become increasingly obvious from queries received and discussions with the mines inspectorate that some parts of the mineral exploration industry were not aware that the *Mines Safety and Inspection Act 1994* and regulations apply to them, or they were aware but were uncertain about how the legislation applied.

.....
The industry can be difficult to reach in generic education campaigns, with a large proportion of small exploration companies with mobile service providers working in remote and inhospitable locations. There are also few safety and health representatives elected for exploration and related functions. Accident and incident reporting rates are low compared to those for mine sites.

Consequently, Resources Safety ran the inaugural Exploration Safety Roadshow in November last year. Originally intended to run at Technology Park in Bentley and the WMC Conference Centre in Kalgoorlie, Mineral House at East Perth was added as a second metropolitan venue when Bentley was oversubscribed.

The three venues ran concurrently via videoconferencing, with live feed to and from Bentley. As a trial run to expand accessibility for future events, Resources Safety had also invited companies with remote sites to participate. BHP Billiton Mt Whaleback volunteered as a test site.

As well as supplementing the occupational safety and health information presented at the 2008 Mines Safety Roadshow, the 2008 Exploration Safety Roadshow provided an opportunity to raise awareness in the exploration industry of responsibilities

under the legislation and address specific topics on legal and reporting requirements, duty of care obligations, and occupational safety and health topics including compressed air, hazardous manual tasks, dust and noise.

A variety of industry participants attended, including managers, supervisors, directors, geologists, field technicians, drillers and safety and health representatives.

Despite testing all the systems the week before, the event organisers discovered that even the best laid plans can go awry — particularly when a fire alarm sounds in the middle of a videoconference, and the East Perth audience was required to vacate the premises! However, the morning tea was brought forward, allowing the East Perth audience time to re-join the conference following the evacuation drill, and the presentation schedule kept on track.

The possibility of an annual series of Exploration Safety Roadshows was canvassed through a survey of participants. Feedback indicated that it is important to maintain dialogue with the exploration sector, but changes to the format needed to be considered to overcome technical and presentation difficulties.

Two Exploration Safety Roadshows will be held in the coming year in Kalgoorlie and Perth. There will be a videoconference between the two venues but, as an added opportunity for remote locations to gain access, simultaneous webcasting has been arranged. This means that anyone can access the web address provided and view all or any of the presentations. There will also be an opportunity for web viewers to ask questions by direct phone-in.

The event details, including presentation schedule and URL, will be posted on the Resources Safety website when confirmed.



SH Bentley



TYC East Perth



TYC Jim Boucalt presenting in Kalgoorlie



AB Kalgoorlie

2009-10 CALENDAR OF RESOURCES SAFETY EVENTS

EXPLORATION SAFETY ROADSHOWS

August 2009

- Date:** Wednesday, 19 August
- Time:** 8.00 am for 8.30 am start, with 11.30 am finish
- Locations:** Perth and Kalgoorlie
(videoconference with simultaneous webcast)
- Topics:** Radiation safety
Reporting
Heat stress

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

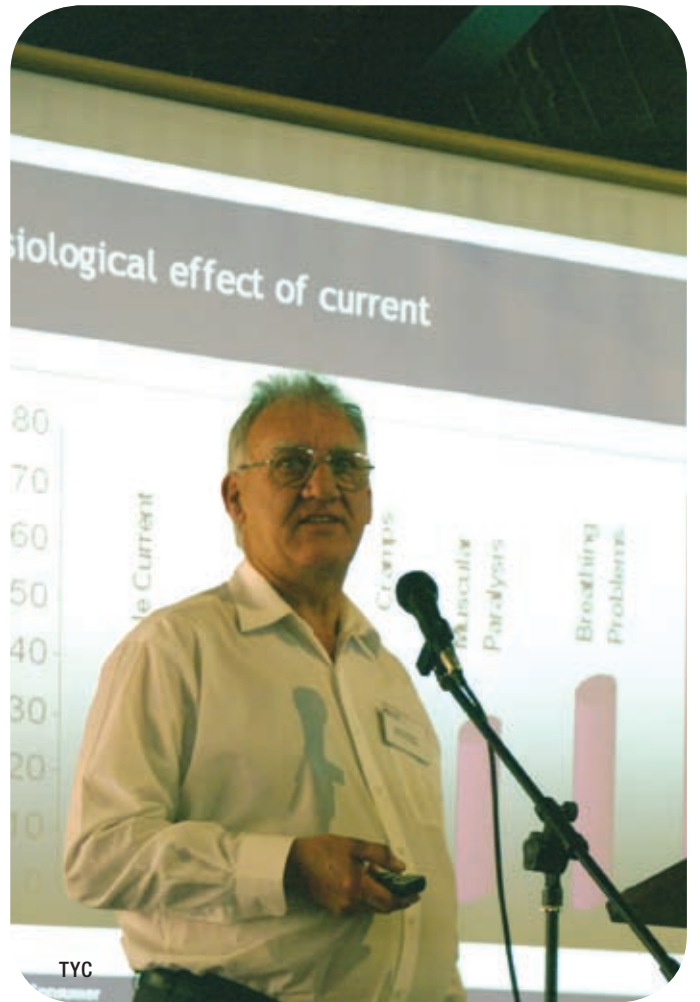
MINES SAFETY ROADSHOW

October 2009

- REGIONAL** 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
- METRO** 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
Safety culture break-out session
Process safety

**Further information will be posted at
www.dmp.wa.gov.au/ResourcesSafety
as it becomes available**





MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. 151

CRUSHED IN A PINCH POINT OF FIXED ELEVATING WORK PLATFORM (EWP) – FATAL ACCIDENT

Incident

Whilst undertaking a pump change and repair work on a fixed scissor lift elevating work platform (EWP), an engineering tradesperson was crushed in a pinch point sustaining fatal injuries.

The deceased was an experienced tradesperson and had been trying to identify the cause of an ongoing problem in the lift ram circuit of the EWP. Work included fitting a new pump and modifications were made to the hydraulic circuit to power the EWP by means of the installation of a manual ball valve control and an external portable pump.

The deceased was found by a contract employee lying face down trapped between the EWP safety prop or bar and the safety prop securing bracket. The deceased was aware of the hazard and had previously used the safety prop to secure the EWP in an elevated position.

During reconstruction testing, under controlled conditions, the

fixed EWP was observed to descend as a result of the loss of oil from the lift ram circuit via the additional hydraulic circuit and ball valve arrangement.

Immediate causes and contributory factors

- The deceased put himself unwittingly in a position where he was exposed to a hazard while reaching into the scissor lift when it came down unexpectedly.
- There was a lack of safe work procedures, job safety analysis and supervision for the repair work being undertaken.
- A manually operated ball valve was positioned within the workings of the EWP.
- The lift ram circuit was fitted with a variable rate flow descent control valve which was fully open with no restriction. This would allow an unrestricted rapid descent of the EWP in the event of any loss of oil from the lift ram circuit.
- Neither the EWP nor the external small portable pump found at the site had a check valve fitted to hold and retain the EWP in an elevated position.
- The safety prop was not in place to secure the EWP at the time of the accident.
- There was no guarding installed around the safety prop and securing bracket.

- The deceased was working on the EWP alone – previously another employee had assisted him when installing the safety prop.
- There was evidence of a spillage of hydraulic oil on the floor underneath the fixed platform. However, it is not known if the oil was lost prior to or at the time of the accident.
- A pendant, pump toggle control switch was found to be defective and would knock off if given a light tap or when dropped.

Comments and preventative actions

- In accordance with Section 9 of the *Mines Safety and Inspection Act 1994*, employers are required to ensure that a safe system of work is developed for any work being undertaken. Where procedures are not available, employers should utilise job safety analysis (JSA) mechanisms to document the task, identify the risks and specify the safety controls to be used prior to the work being undertaken.
- All maintenance work needs to be regularly monitored and supervised throughout the shift to verify compliance with safety requirements, identify any deviations from safety standards and ensure alternative safe work methods are put in place to correct these deviations.
- Additional assistance should be made readily available on demand to employees working alone, to ensure that they do not over-extend themselves.
- Identified hazards should be managed and controlled in accordance with the hierarchy of control. The aim of a good risk analysis should be to eliminate the hazard, substitute a safer method or engineer out the hazard, in preference to accepting the risk and writing more safety rules, providing personal protective equipment (PPE) or both.
- Where the removal of moving machinery is impracticable, guarding of all pinch points and moving machinery parts is essential in protecting employees from inadvertent access.
- In accordance with Australian Standard AS 1418 *Cranes, hoists and winches*, all fixed EWP equipment and any external auxiliary pump, when used to operate an EWP, must be fitted with check valves on the lift ram circuit to prevent a rapid descent of the EWP due to any failure of the hydraulic circuit components.
- Where manually operated devices are installed for the purpose of external control of a EWP (as in the case of the manual ball-valve in this instance), they should be located outside the range of influence of the moving parts of the unit.
- All portable equipment should be regularly checked and maintained in an operational condition. Toggle switches that become defective should be replaced.

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. 152

HAUL TRUCK AND LIGHT VEHICLE COLLISION

Incident

An unloaded Caterpillar 789C haul truck and light vehicle collided at a controlled mine intersection. The right side front and rear wheels of the haul truck ran over and crushed the cab of the light vehicle. The light vehicle driver sustained fatal injuries. Cutting equipment was used to free the light vehicle driver.

The incident was re-enacted with an exemplar truck and light vehicle, based on information derived from the interviewing of witnesses and the road marks visible after the collision. It appears that the combination of the alignment of the (terminating) haul road as it intersects the main (through) haul road and the converging speeds of both vehicles may have placed the light vehicle behind the right side 'A' pillar of the haul truck's roll over protection structure (ROPS), where it may not have been clearly visible to the haul truck driver. Similarly, the light vehicle driver's view of the haul truck as he approached the intersection may have been obscured by the light vehicle's internal rear vision mirror.

Immediate causes and contributory factors

- The intersection was not designed and constructed at a 90° angle.
- The slight uphill grade from the terminating road to the intersection.
- The curvature of the main haul road.
- Both drivers' fields of view were restricted at the intersection due to poor sight approach lines and distances, windrow height and vegetation on the windrows.
- The speed at which the haul truck entered the intersection.
- Possible restriction of the haul truck driver's field of vision due to the cabin ROPS frame structure and the fact that the light vehicle was approaching from the right (blind) side of the haul truck.
- Possible restriction of the light vehicle driver's field of vision due to the rear vision mirror, which may have obscured a clear view of the haul truck approaching the intersection.
- A lack of auditing, risk assessments and maintenance of the intersection.

Comments and preventative actions

- Perform regular documented traffic management audits and risk assessments on all intersections to identify potential collision hazards.
- Develop a site traffic management plan.
- Where determined by a risk assessment or where sight distances at intersections are less than prescribed in Australian Standard AS 1742.2:1994 *Manual of uniform traffic control devices – Traffic control devices for general use*, 'STOP' signs should be utilised instead of 'GIVE WAY' signs at intersections.
- Ensure traffic signage is regularly maintained and not obscured by vegetation, poles or other signage.
- Ensure vegetation is regularly removed or trimmed from windrows on approaches to intersections.
- Ensure windrows are tapered down to 0.75 m near intersections to increase visibility.
- Ensure terminating roads are positioned at 90° to through roads to allow for maximum sight distances.
- Intersections should be placed in safe locations away from vertical or horizontal alignment changes.
- Approaches to intersections should be constructed at a flat (0%) grade for a minimum distance of the length of the longest vehicle using the intersection.
- Consider lowering speed limits on through roads at intersections that are deemed to be high risk as a result of formal risk assessment.
- Install median bunding to ensure right angle entry to roads and to slow speeds of turning vehicles (bunding should be set 2 m back from through road to allow good visibility).
- Consider separation of light and heavy vehicles by means of separate mine access roads for light vehicle use only.
- Ensure daily inspections of haul roads and intersections are carried out by a competent person.
- Ensure that operators are informed of road and traffic management changes at the work site when they have returned from time off.
- All vehicle types should be examined for potential blind spots and attempts should be made to eliminate or reduce them.
- Ensure that all vehicle operators are aware of residual vehicle blind spots.
- Consider fitting both heavy and light vehicles with proximity detection devices.

MINES SAFETY BULLETIN NO. 83

EARTHING OF ANFO LOADERS USED UNDERGROUND (RE-ISSUED) 23 MARCH 2009

Introduction

This safety bulletin replaces *Mines Safety Bulletin No. 7*, dated 23 June 1993, and takes into account subsequent changes to regulations and industry practice.

The pneumatic loading of ammonium nitrate based explosive generates electrostatic charge at a significant rate. Without effective controls, charge accumulation on the delivery hose can rapidly exceed energy levels capable of initiating explosive devices.

Requisite practice for safeguarding against this hazard is to prevent charge from accumulating by providing an efficient discharge path to ground through the use of semiconductive hosing and effective earthing of the loader.

Requirements

Mines Safety and Inspection Regulation (MSIR) 8.41 prescribes the essential requirements to safeguard against this hazard:

- (3) A person must not use a pneumatic loader to load bulk AN-based explosive unless the loader, charging hose and earthing arrangements are safe and efficient and in accordance with the manufacturer's and supplier's recommendations.

- (4) A person using a pneumatic loader to load bulk AN-based explosive must ensure that the explosive is loaded through a semi-conductive hose or tube having a resistance of not less than 15 thousand ohms per metre and not more than 2 megohms for its total length.
- (5) A person charging bulk AN-based explosive must ensure that he or she removes any gloves and is effectively earthed to drain off any static electrical charge before handling and connecting any electric detonators.
- (6) A person must not use water lines, compressed air lines, wire covered hoses, rail or permanent electrical earthing systems as a means of earthing.
- (7) A person must use protected type detonators when pneumatic loading and electric firing.

These requirements are consistent with recommendations detailed in Australian Standard AS 2187.2:2006 *Explosives – Storage and use – Use of explosives*.

Comments

Although non-electric initiating techniques are less susceptible to static than equivalent electrical systems, they are not to be regarded as immune and the requirements should be applied equally to all blasting systems.

HOSES

Semiconductive loading hose is necessary to:

- provide an adequate discharge path to ground for static charge generated during operation of the loader, and

- present a sufficiently high resistance to extraneous ground currents that may be present and transmitted to the blast hole via the hose.

Fully conductive hose is hazardous. To safeguard against unsatisfactory replacement, semi-conductive hose should be readily identifiable. One brand of hose referred to as “LO-STAT” is black with a prominent yellow stripe along its length.

Hose conductivity is known to vary with age and usage. Periodic replacement or testing is necessary to ensure safe values are maintained.

EARTHING

The discharge path to ground is not complete unless the loader is effectively earthed.

Earthing may be effected by connecting a flexible electrical cable between metal parts that are in electrical contact with the loader hose and an electrode in fixed contact with the ground. The cable, electrode and connections must be reliable, appropriate for the environment and afford the required resistance. The total resistance between the loader hose and ground should not exceed 10 megohms.

Certain materials, including galvanised steels, zinc, copper and alloys of these materials can form impact sensitive explosive compounds in the presence of ammonium nitrate. They should not be used in locations where contact with ANFO cannot be avoided.

ELECTRODES

Earthing provided by physical contact of the loader with ground,

contact of the hose within the borehole, and any chains or similar arrangements trailing on the ground below vehicles are regarded as supplementary earthing and not sufficiently reliable.

ANFO loaders permanently installed on mobile plant or operated from an elevating work platform may use extended out-rigger stabiliser legs as grounding electrodes, provided adequate conductivity levels have been confirmed by initial and periodic testing.

Rock bolts may also be used as grounding electrodes, provided an effective connection can be made and periodic sample testing in that area of the mine has shown that the ground conductivity levels afforded do not exceed 10 megohms.

The use of water lines, compressed air lines, wire covered hoses, rail or permanent electrical earthing systems as a means of earthing is prohibited.

Recommendations

A prominent notice should be displayed on or near ANFO loading apparatus requiring the “equipment to be effectively earthed prior to use in accordance with MSIR 8.41”.

However remote the possibility, accidents caused by premature ignition of explosives are potentially lethal. Accordingly, these requirements should be widely communicated to all persons involved with the operation and maintenance of ANFO loaders.

HEAD OFFICE

RESOURCES SAFETY DIVISION, DEPARTMENT OF MINES AND PETROLEUM

Street address: Level 1, 303 Sevenoaks St, Cannington WA 6107
Postal address: Mineral House, 100 Plain St, East Perth WA 6004
Telephone: +61 8 9358 8002 (Monday-Friday, 8.30 am to 4.30 pm)
Facsimile: +61 8 9358 8000
Email: ResourcesSafety@dmp.wa.gov.au
NRS: 13 36 77 (the National Relay Service is an Australia-wide telephone access service available to everyone at no additional charge to assist with call)

COLLIE

Street address: 66 Wittenoom St, Collie WA 6225
Postal address: PO Box 500, Collie WA 6225
Telephone: +61 8 9734 1222
Facsimile: +61 8 9734 1606
Email: collie.inspectorate@dmp.wa.gov.au

KALGOORLIE

Street address: Cnr Broadwood and Hunter Sts, Kalgoorlie WA 6430
Postal address: Locked Bag 405, Kalgoorlie WA 6433
Telephone: +61 8 9026 3200
Facsimile: +61 8 9021 7670
Email: kalgoorlie.inspectorate@dmp.wa.gov.au

MINES SAFETY (including exploration, mining and mineral processing)

Telephone: +61 8 9358 8079 (general enquiries)
+61 8 9358 8101 (mines safety reporting forms and guidelines)
+61 8 9358 8178 (safety and health representatives)
Facsimile: +61 8 9325 2280
Email: MinesSafety@dmp.wa.gov.au (general enquiries)
axtatmanager@dmp.wa.gov.au (mines safety reporting forms and guidelines)
mineshreps@dmp.wa.gov.au (safety and health representatives)

For a serious mining accident or incident, mine site must advise District Inspector as soon as practicable

MINE PLANS

Telephone: +61 8 9358 8115
Facsimile: +61 8 9358 8000
Email: rsdmineplans@dmp.wa.gov.au



HEALTH SURVEILLANCE (MineHealth) AND CONTAMINANT MONITORING (CONTAM)

Telephone: +61 8 9358 8469
Facsimile: +61 8 9358 8094
Email: contammanager@dmp.wa.gov.au

OCCUPATIONAL HEALTH

Telephone: +61 8 9358 8461
Facsimile: +61 8 9358 8094
Email: minehealthreporting@dmp.wa.gov.au

COMMUNICATIONS (including publications, events, MineSafe subscriptions)

Telephone: +61 8 9358 8154
Facsimile: +61 8 9358 8000
Email: RSDComms@dmp.wa.gov.au

DANGEROUS GOODS SAFETY AND LICENSING (including explosives, fireworks and major hazard facilities)

Telephone: +61 8 9358 8002
Facsimile: +61 8 9358 8000
Email: ResourcesSafety@dmp.wa.gov.au (licensing enquiries)
dgsb@dmp.wa.gov.au (dangerous goods safety enquiries)
rsdspatial@dmp.wa.gov.au (dangerous goods pipelines enquiries)

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

PETROLEUM SAFETY (onshore petroleum pipelines and operations)

Telephone: +61 8 9358 8124
Facsimile: +61 8 9358 8000
Email: psb@dmp.wa.gov.au

UPDATE YOUR CONTACT INFORMATION

If you have moved or changed jobs and are not receiving *MineSafe*, or wish to be added to the mailing list, please contact:

PUBLICATIONS

Resources Safety Division

Department of Mines and Petroleum

100 Plain St, East Perth WA 6004

Telephone: +61 8 9358 8154
Facsimile: +61 8 9358 8000
Email: RSDComms@dmp.wa.gov.au

MineSafe is published by the Resources Safety Division of the Department of Mines and Petroleum (DMP). It is distributed free of charge to employers, employees, safety and health representatives and interested members of the public.

Reproduction of material from *MineSafe* for wider distribution is encouraged and may be carried out subject to appropriate acknowledgement. Contact the editor for further information.

Mention of proprietary products does not imply endorsement by Resources Safety or DMP.

Comments and contributions from readers are welcome, but the editor reserves the right to publish only those items that are considered to be constructive towards mining safety and health. Reader contributions and correspondence should be addressed to:

MineSafe Editor
Resources Safety, DMP
Mineral House
100 Plain Street
East Perth WA 6004

Editor: Dr Susan Ho
Enquiries: 08 9358 8149
Email: RSDComms@dmp.wa.gov.au
Website: www.dmp.wa.gov.au

This publication is available on request in other formats for people with special needs.

LIST OF CONTRIBUTORS (FROM RESOURCES SAFETY UNLESS OTHERWISE INDICATED):

Doug Austin
James Bowen, *DMP*
Denis Brown
Melinda Burmas
Pina Compagnone, *DMP*
Dean Cunningham
Peter Drygala
Alan Gooch
Phil Hine
Susan Ho
Donna Hunt
Martin Knee
Russell Miners
Tara Morris, *The TKM Institute*
Melina Newnan
Lindy Nield
Peter O'Loughlin
Wendy Pietrocola
Simon Ridge
Tony Robertson
Anita Rudeforth
Monika Sarder, *The AusIMM*
Jean Stewart, *DMP*
Chris Stubbley
Chris White

PHOTO ATTRIBUTION (RESOURCES SAFETY):

AB = Angela Bakota
CW = Chris White
DE = David Eyre
JB = Jim Boucaut
JF = John Farrow
SH = Susan Ho
TYC = Tse Yin Chang

