



# MineSafe

Western Australia



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special..... page 8



**Taking underground**  
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Resources Safety 



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Main cover photo from the 2005 Underground Mine Emergency Response Competition courtesy of Michael Lovitt.

## In this issue

As 2005 draws to a close, it's time to reflect on what has been a busy year for Resources Safety. Many of our activities, including the introduction of changes to the *Mines Safety and Inspection Act* that were introduced in April, and the Mines Safety Roadshow in October (which you can read about on page 16), have been directly related to the mining industry. It has been wonderful to see the positive response to our efforts to improve safety and health, and to know that workers and employers are taking these issues seriously.

Unfortunately, the year has not been without incident, including at the time of going to print four fatalities in the mining sector. Accidents and incidents are always upsetting, especially when we know they can be avoided.

A number of articles in this issue of *MineSafe* talk about the importance of looking after inexperienced or young people in the workplace. The industry has changed in recent years, and a boom in the mining sector combined with changes to work arrangements means that there are many people entering the industry with little or no knowledge of or experience on a mine site. It's easy, especially when resources are stretched, to cut corners or make assumptions about people's understanding of specific safety issues, but this should never be allowed to happen. We all have a duty of care to look after our fellow workers, and an attitude of looking after our mates is something in which the mining sector has always taken pride. If you've been in the industry a long time, remember what it was like when you first started out and try to share what you have learned with less experienced colleagues. If you are new to mining, be aware that workplaces may be quite different to those in other industries where you have worked previously, and speak up if you have any questions or concerns about safe work practices.

Summer is upon us, and with the heat comes a range of additional hazards, especially for people who work outdoors. Our four-page special on summer safety starts on page 8, and much of the advice is just as important when we're not working as when we are. We encourage everyone in the industry to adopt safe practices in all aspects of their lives, so even if you're taking time off you can follow these tips on safety and health, such as protecting your skin or making sure you're prepared for travel in remote locations.

Finally, I wish our *MineSafe* readers and their families safety and happiness in the festive season. I look forward to an incident-free year in 2006.

### Malcolm Russell

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# Looking after new starters

## — a valuable resource and extended duty of care

In times when the mining industry is rapidly expanding in many sectors and a significant number of new projects are starting up, experienced human resources tend to become scarce, wage and salary packages grow, and new people come into the industry, attracted by the benefits available. Unfortunately, this can often mean an increase in the risk of injury or death in circumstances where more experienced workers would have the necessary knowledge and skill to avoid adverse consequences, but new starters may not be aware of the particular suite of hazards peculiar to mining.

Historically, in many mining communities, the necessary knowledge was passed down within families. Young men (as they were exclusively in those days), destined for a career in the industry, would pick up the fundamentals of the job, and a good understanding of the potential hazards and how to deal with them, from fathers and uncles around the dining table. When the turn of those youngsters came to start work in the local mines, often there were family members working there with a special interest in keeping them safe and making sure that they were well protected. This was particularly important in the early days of their careers, until they picked up the fundamentals of safe working practice.

Even where family members were not working together, an extended mining family with long experience took special care of the new starters, knowing full well that they would not have the necessary knowledge and experience of the hazards to keep themselves safe at all times.

Mining has moved on since those days, with mechanisation and improved methods of work, but special hazards still remain. What is sometimes missing, particularly in new or expanding mines where



Photo courtesy Michael Lovitt

*It's more important than ever to look out for the safety of new starters*

everyone is busy with their own part of the work, is that sense of community responsibility for the safety of less experienced colleagues.

Put simply, ensuring safety is everyone's job — we always have and still need to look out for each other, especially the most vulnerable among us.

Employers and employees each have a duty of care under the mining safety legislation. The employer's fundamental duty is to provide for a safe workplace and system of work, while the employee's duty is to take care of their own safety and that of others.

It is important to realise that these duties are owed to people as individuals and that, sometimes, the duty may be higher and more difficult to fulfil — for example, in the case of inexperienced workers who may not have the necessary understanding of hazards that is common with people of more experience. Young workers may also have a false sense of invulnerability that more experienced hands have long lost, as they have gained knowledge of just how badly things can go wrong in the most unexpected circumstances.

An individual may well be a competent worker in another work environment and have a good understanding of his or her trade or profession, but mining remains significantly different, and the hazards and energy levels involved may be significantly higher than, say, a competent tradesperson or operator may be used to in the industry from which they came to mining. It is important not to assume that such people have the necessary know-how to deal with the mining work situation.

Particularly in this time of rapid industry expansion, it is even more necessary for employers, managers and more experienced fellow workers to look out for the safety of new starters and youngsters. We need to ensure that they are made fully aware of the potential for unusual mining hazards that they may not have knowledge of, that they are properly trained to deal with these hazards and that they are closely supervised (including a friendly eye from their mates) until they have sufficient competence to look after themselves in the often harsh and unforgiving mining work environment. This special care should be extended even to experienced mining people coming to a new mine from one where conditions or plant may have been very different. Again, do not assume that everyone knows what you know about the mine where you work!

The temptation, when things are busy or difficult and there is much pressure on experience and skill, is to shorten the period over which new starters receive this special consideration, and assume that they know what more experienced workers know. This must not be allowed to happen. The most experienced of mine workers was a new starter once and it should be a matter of personal and professional pride to pass on the tradition of looking out for our mates to the most vulnerable people in our industry.



# Resources Safety **feasibility study**



On 9 November 2005 Mr Alan Carpenter, the Minister for State Development and Energy, announced the appointment of Stuart Hicks to undertake a study into establishing a new body to oversee health and safety in Western Australia's resources sector.

Mr Carpenter said that the feasibility study would be part of the State Government's commitment to further strengthening mine safety in Western Australia.

'Mr Hicks has occupied a wide variety of senior positions during his 20 year career in the Western Australian public sector, and has had extensive advisory roles in Ministerial strategic policies and directions,' Mr Carpenter said.

'For the last eight years, Mr Hicks has chaired the National Transport

Commission, with responsibility for national policy aspects of railway and heavy vehicle safety. He also chaired the Machinery of Government Taskforce and the Perth City Rail Advisory Committee in 2001.'

Mr Carpenter said that the study would examine the systems, procedures, funding requirements and reporting processes required to operate a leading resources safety regulatory authority in Western Australia.

The review is being conducted in three stages.

Stage 1 will be a review of existing operating safety models in Australia and overseas to identify the key characteristics, risks and fundamental aspects of these models. Part of this will be identifying the key competencies required and resources needed to operate within the various models.

Stage 2 will propose a draft framework of a safety case model for Western Australian mining and mineral processing operations. Subject to endorsement by the Mines Safety Improvement Group, this will form the basis for conducting stage 3 of the review.

Applying the safety case framework as endorsed, stage 3 will analyse all relevant benefits and costs, including its advice on funding and the best mode of delivery, whether through the Department of Consumer and Employment Protection or a safety authority.

Mr Hicks will report back to the Minister by 13 April 2006. The Department of Industry and Resources is funding the study and providing Mr Hicks with technical and administrative support.

Consultation with industry and community stakeholders is an important part of the feasibility study, and written public submissions are invited. These should be sent to:

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100 Plain Street  
East Perth WA 6004  
email [richard.langford@doir.wa.gov.au](mailto:richard.langford@doir.wa.gov.au)

Submissions will be accepted up to 31 January 2006 and will be published on the Resources Safety Feasibility Study website at [www.doir.wa.gov.au/resources\\_safety](http://www.doir.wa.gov.au/resources_safety)

## Reducing **vehicle impacts**

Following our request for readers to tell us about safety and health solutions in the minerals industry that could benefit others, we have news about a safer option for bull bars on mining vehicles.

Smartbar was invented and is manufactured in Australia. It provides a more flexible buffer effect between the vehicle and the object it strikes, absorbing up to 70% of G forces in an accident, reducing impact forces and resulting in less injuries and damage.

The polyethylene bull bar is a major breakthrough in pedestrian safety, as

testing at The University of Adelaide's Road Accident Research Unit (now Centre for Automotive Safety Research) in 1998 showed. Professor Jack McLean conducted a head form impact test.

In the test report's executive summary, Professor McLean stated, 'The Smartbar performed better than the steel and aluminium bars in all tests, and in some cases afforded reasonable head protection during the impact, as measured by the Head Injury Criterion. The

bar also performed better than the unprotected vehicle.'

Many mining companies are now using polyethylene as a safer option to metal bull bars to reduce the likelihood of workplace injury. Also, because polyethylene has a 'memory', it returns to its original shape after most impacts, resulting in significant savings on vehicle repair and vehicle down-time costs.

Information on the work of the Centre for Automotive Safety Research is available at [www.casr.adelaide.edu.au](http://www.casr.adelaide.edu.au)

# Taking underground safety

## to the next level

In the 25 years to the end of 2004, 88 workers died underground in Western Australian mines.

Thirty four of those 88 workers were killed in rockfalls. This equates to nearly two out of every five deaths being caused by unstable ground.

More than one in five (19) died after being struck or crushed by a vehicle or other man-made heavy object or machinery, and one in seven (12) fell to their death.

Almost one in every 10 (9) was killed by drowning.

The other 14 died in a run of ore (6), an explosion (2), a lack of air (2), and an electrocution (1).

While the past few years have shown a marked decrease in the number of underground mining fatalities, the complexity and diversity of the industry means there is an ongoing need to ensure we do not become complacent.

Certainly, the strong focus in recent times has been on hazard identification and reporting, training and more stringent regulation, but one area perhaps not generally

receiving the attention it deserves is the need for greater understanding of rock stress problems in underground mines.

With the growing number of new people coming into underground mining — and often staying in the industry for only a few years — the proportion of highly experienced underground miners is declining.

The pool of available experienced miners is being diluted by an influx of inexperienced people.

This means that mine managers and underground supervisors must invest more time and energy in training their underground workforce, rather than being able to rely on the older, more experienced miners to closely supervise and train the newcomers.

However, even without increasing the level of sophistication currently present in hazard management — such as the possibility of robotic mining — some clear thinking can help reduce the existing primary hazards in underground mines.

For example, it is just good sense to firmly resist the temptation to go

into unsupported areas to work on machinery at the face.

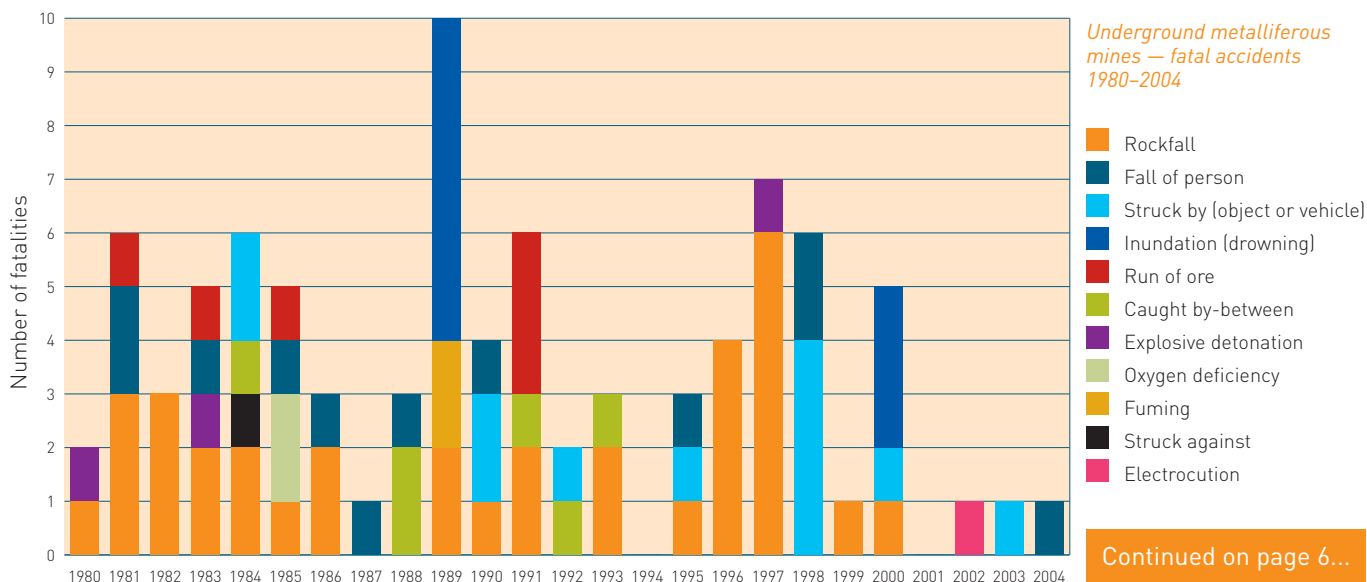
If the booms on a jumbo need adjusting before drilling can commence, then reverse out until the booms are under supported backs and sides of the drive.

This way, you are working under secure ground, rather than risking an unexpected rockfall on you and the equipment. It is worth remembering that this is why you are rockbolting or shotcreting the area in the first place.

Ground conditions in stoping areas rarely remain the same over the life of a mine. The interaction of nearby stopes and development can cause ground conditions to change.

If ground needs supporting then it is foolhardy to venture into unsupported areas. Yes, it's an inconvenience to wait — but so is losing your life. And what else were you planning to do with your last five minutes alive? Far better to move the equipment back.

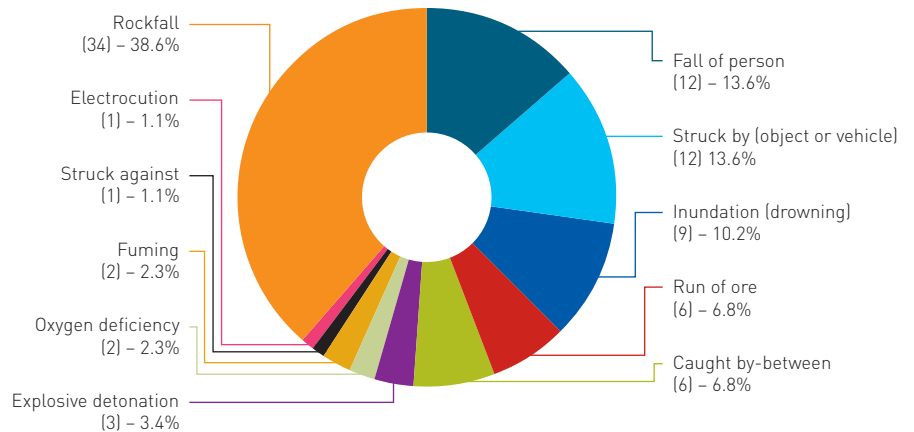
With a quarter of fatalities in those 25 years resulting from mishaps with vehicles, machinery and falls from height, it is timely to reinforce the



...from page 6

message that taking shortcuts in any of these areas can cost you your life.

Failing to make sure the brake is on and that the wheels are turned into the sides of the drive or decline before working on vehicles, not venturing into areas where remote boggers are active without first announcing your arrival, and failing to use safety harnesses when working at height, are all shortcuts that can hasten your demise.



Western Australian underground mining fatalities 1980-2004

## Securing the ground is vital

Not looking and thinking beyond the beam of your cap lamp can bring you great harm, according to Adrian Lang, Acting Director Technical Services in Resources Safety.

'We need to be thinking more about the general condition of the rock when working underground,' said Adrian.

'All too often, underground miners only view what is in their immediate vicinity. They may not be looking or thinking about what's happening outside their cap lamp's beam.'

'It's very important to consider the effect of your actions on other stopes,

drives, et cetera, and how this may lead to ground control problems.'

Adrian said that the dangers of water in underground mines were often overlooked.

'Water in underground mines is often not given the respect it deserves. We just see it lying in pools or quietly flowing somewhere, but if this develops into a high head of water in drill holes, ore passes, waste passes or stopes somewhere else in the mine, the results can be catastrophic.'

'We saw this a few years ago when a bulkhead failed and saturated mine-fill flowed into lower levels of a

Western Australian mine, killing three workers.

'Four miners were also killed in an interstate coal mine incident when old, flooded workings were breached, releasing a large volume of water that swept through the adjacent mine,' said Adrian.

'The old miners didn't have the benefit of today's technology, so if you're mining in or near old workings, ensure the historic plans are accurate.'

According to Adrian, ground control is one of the key areas upon which miners need more focus and understanding.

'As the ore is extracted, stress readjustments occur in the rock mass and this can significantly affect how the rock responds.'

'Stresses can increase — or decrease. Decreases can sometimes be worse because removing confinement from a particular area of rock can result in it failing along pre-existing weaknesses in the rock mass.'

Adrian said that joints, faults and shears — planes of weakness in the rock — could be quite thin, but continuous.

'You can have intersecting joints forming a potentially unstable block in the backs



Photo © Allan Francis

Ground control is one of the key areas miners need to focus on and understand

or sidewalls of a drive. Nearby stoping can remove the confining forces, causing the rock to move or slide along planes of weakness, where it can fall out.'

And with rock weighing around three tonnes per cubic metre — more than three times the weight of the same volume of water — that fall-out can be the equivalent weight of a housebrick — or hundreds of tonnes.

'Rockfalls are aggressive and very unforgiving, and you don't get too many second chances,' Adrian said.

'Getting hit by the equivalent of a housebrick is really going to hurt and could be fatal. If struck by a cubic metre or more of rock, you're unlikely to survive.'

Enormous forces are present in rock formations beneath the earth's surface. Pressure within rock is measured in megapascals (MPa). One megapascal in everyday usage is equivalent to a pressure of about 100 tonnes per square metre.

Adrian indicated that, at 1,000 metres below the surface, the vertical rock pressures can be about 30 MPa, which is equivalent to 3,000 tonnes per square metre.

'The horizontal rock pressures can be two-to-three times the vertical rock pressure — that is, 6,000 to 9,000 tonnes per square metre, at a depth of 1,000 metres,' Adrian said.

'The larger the difference between the vertical and horizontal rock pressures, the more difficult the ground control problems become.

'These pressures are a normal component of the pre-mining or virgin rock stress field generated by the over-lying weight of the rock, plus pressures from historic folding of the Earth's crust by tectonic activity.

'However, mining activity can increase or decrease this rock pressure and bring about unexpected failures in the rock mass.

'Increases in rock stress can result in rock bursts causing pieces of rock to be shot or ejected from the backs, walls or face of a heading, with the potential to hit workers or equipment and do serious damage.'



*The dangers of water in underground mines are often overlooked*

It is therefore very important for appropriate equipment to be used for scaling, for support of the rock surface and installing rock bolts.

Adrian said that development jumbos are not purpose designed and built for installing ground support. They are designed for boring holes.

'Fit-for-purpose equipment should always be used to pick up and position mesh, and to install rock bolts as part of ground support.'

Adrian said that shotcrete was usually applied pneumatically with a retarder to slow the cement reaction. In addition, an accelerator was included at the nozzle to cause rapid set of the shotcrete as it was applied to the rock face. Where needed, steel or plastic fibres can provide tensile strength.

Shotcrete is generally applied with equipment that is purpose designed and built.

'It is vital that mesh, rockbolts and shotcrete are used where appropriate, based on a good geotechnical assessment of ground competency.

'Using the correct ground support tools will result in less damage, repairs and delays, and the costs associated with equipment downtime. We rightly spend a lot of time and money on people and equipment, but the rock is often ignored until something goes wrong,' said Adrian.

'Miners frequently don't appreciate the forces locked into the rock mass. If we don't take account of the rock and how

it responds to our mining activity, we can end up with a major adverse event.

'It is crucial that miners have a healthy respect for the rock mass in which they work, and an understanding of how it responds is critical to the process of mining. If all underground miners have an adequate understanding of and respect for rock mass, the industry will be safer.'

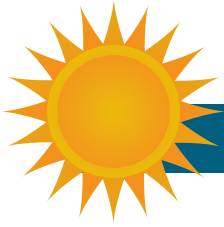
Adrian said that each mine should develop a ground awareness program appropriate for the mine. No two mines had the same ground conditions, and no two pieces of rock are the same. This is what makes underground mining unique.

When installing ground support, make sure it is done properly, with the appropriate amount of mesh overlap, the required number (and length) of rockbolts (resin-grouted if necessary), and the correct thickness and strength of shotcrete where required.

Adrian noted that common engineering materials such as steel, plastic, aluminium and concrete have physical properties that are well known and consistent, but this is not true with mining, where you can have a significant range of rock stresses and rock strength, making the rock mass response quite variable.

To move safety to the next level in underground mining, all miners need to increase their understanding of the ground behaviour in their mine.





# Heat stress can be a killer

Heat stress is a very real danger on Western Australian mine sites — both inside and outside — and extra care should be taken to avoid the risk of heat stress, or the more serious risk of heat stroke.

Heat stress can result from extremely hot weather conditions — common in the state's mining regions — or exposure to constant high temperatures in the workplace.

Treatment plants and refineries, in particular, use processes involving extreme heat when treating ores and concentrates. Hot processes can be associated with work involving smelters and direct reduction plants, kilns, furnaces, roasters, autoclaves and elution columns.

Heat causes increased sweating, depleting the body's fluids and leading to tiredness, irritability, inattention and muscular cramps — the symptoms of heat stress. Apart from the obvious discomfort of these

symptoms, they may increase the risk of workplace incidents causing injury, and this is of major concern.

Workers in extremely hot environments can lose a litre of fluids per hour, and it is important to replace these lost fluids.

For outdoor workers, heat stress can be avoided by taking simple steps such as drinking at frequent intervals, having rest pauses in a cool place and helping sweat evaporate by increasing air circulation. The type of clothing worn is also very important — loose clothing allows air to circulate, improving the evaporation of sweat.

Workers involved in hot processes indoors must also understand the processes with which they are working, identify potential hazards such as heat, and use safe work procedures such as control measures and personal protective equipment. Personal protective equipment can include items such as aprons, gloves,

face and respiratory protection, and air- or ice-cooled vests.

Heat acclimatisation is also important, as it may take several days for a worker to acclimatise to working in the extreme heat generated by hot processes. A formal acclimatisation program should be undertaken by new employees and workers returning after extended periods of leave.

Heat stroke is a far more serious condition than heat stress, and it must be treated immediately. The signs of heat stroke are cessation in sweating, high body temperature, and hot and dry skin. There may also be confusion and loss of consciousness.

If heat stroke is suspected, the person should be treated by a doctor as soon as possible. Until medical treatment is available, cool the person down as quickly as possible by soaking their clothing in cold water and increasing air movement by fanning.

The effects of extreme or sustained heat can seriously affect a worker's concentration levels, and the consequences can be tragic. Guarding against heat stress and heat stroke is part of providing a safe and healthy workplace, so employers need to ensure that preventative measures are in place.

Resources Safety has a Mine Safety Matters brochure on working in hot processes, and information on heat stress is available on the Safetyline website at [www.safetyline.wa.gov.au](http://www.safetyline.wa.gov.au), in the essentials section, under occupational diseases.

There is also a variety of information on the hazards of working in heat available from Comcare, a Federal Government agency, and published as OHS Fact Sheet No. 27. For further information, contact the Comcare OHS Hotline on 1300 366 979, email [ohs.help@comcare.gov.au](mailto:ohs.help@comcare.gov.au) or visit the publications section of [www.comcare.gov.au](http://www.comcare.gov.au)



*Heat stress is a very real danger on mine sites, and steps should be taken to avoid it*





# Digging deep for better health

A recently released study carried out on the mining industry in the Goldfields region of Western Australia has provided a revealing snapshot on the health status of male workers, including showing that the quality of their health and lifestyle is in part determined by their work practices.

The study, titled Digging Deep for Better Health, commenced in October 2003 and was undertaken by Nick Keown, a research officer with Goldfields Men Health (GMH), on mine sites located within the Goldfields region, including the city of Kalgoorlie-Boulder.

Its main aim was to examine the general psychological and social health of a representative sample of 744 male mine workers from 29 mining organisations. It used an integration of qualitative and quantitative research techniques and included information from partners.

According to David Kennedy, chair of GMH, about two-thirds of the 510 respondents to the survey reported no problems with work or other activities as a result of physical health problems.

'While these workers identified health components that reflect a healthy lifestyle such as sound nutrition, regular exercise, relaxation and good quality sleep, in practice few of them reported maintaining a healthy lifestyle.'

Mr Kennedy said that the research showed few of those interviewed took part in regular individual or group sport, or even in moderately intensive levels of physical activity.

'Those interviewed are concerned with issues including fatigue, stress, adverse physical, emotional and behavioural changes, social isolation and relationship problems.'



*Recommendations from the Goldfields health study included encouraging the use of health services*

Behavioural changes also noted included increased smoking, caffeine and alcohol consumption.

'Most shift workers reported high levels of sleep disturbance involving deficits in the quality and quantity of sleep, and one-third revealed they were struggling to manage the relationship between work practices and good health.'

The study defined a range of parameters in which the analysis was carried out, restricting it to workers engaged in contractual work arrangements, long work hours (hours worked beyond the normal eight-hour day with total number of hours exceeding 44 hours per week), intensive shift rosters and work schedules, and long distance commuting.

The study also found that the effects of long hours and shift work, such as changes to mood and energy levels, are transferred between the workplace and home, and impact negatively on work and family relationships.

Mr Kennedy said that GMH would pursue the recommendations made in the study, including education in self care, promoting health-enhancing behaviours, encouraging the use of health care services in the Goldfields region, and working on the implementation of stress and fatigue management procedures.

The study also recommends that mining organisations consider the introduction of workplace wellness (fitness) programmes, and suggests a re-examination of current work practices in terms of risk management, considering fatigue and the design of shift rosters and work schedules.

'These significant findings are a whole-of-community problem and we must all work hard to improve the health status of men in mining,' Mr Kennedy said.

Mr Kennedy also said that the research would not have been possible without the encouragement and full cooperation of the Chamber of Minerals and Energy WA, Eastern Regional Council and other mining employers.



# Working and travelling

## in remote locations

Western Australia is a vast state with extreme weather conditions and rarely travelled roads, and many workers need to visit remote locations in the course of their work, often alone.

Employers have a responsibility to provide and maintain a safe work environment for all workers, irrespective of the location of the workplace. Remote locations present a unique set of hazards, but the risks must still be assessed and all practicable precautions taken.

The risks to lone workers in remote locations can include emergency situations that may arise because of the sudden onset of a medical condition, accidental work-related injury or disease, attack by an animal, exposure to the elements or becoming stranded without food or water.

One of the most basic requirements for a safe work environment for workers in remote locations is communication. A means of communication in an emergency and a procedure for regular contact with others is essential.

Also basic to providing a safe work environment is training. Anyone who works and travels in remote locations should be provided with adequate information, instruction and training. They need to understand the hazards that they may face and the procedures to be followed.

The aim is that a lone worker in a remote location should be able to:

- carry out all work activities safely without direct supervision;
- manage events that are likely to occur when working alone;

- follow procedures to obtain emergency assistance if required;
- follow procedures to establish regular contact with a nominated person; and
- operate safely despite the lack of infrastructure and support, and sometimes in adverse climatic conditions.

To make this possible, the worker should be provided with a suitable vehicle where appropriate and suitable equipment to work alone, including communications and emergency equipment.

Some of the issues to take into consideration when assessing the risks faced by employees working alone or in isolated areas include:

- length of time the person may be working alone;
- time of day in which the person will be working alone;
- availability of means of communication;
- means of transport provided to the worker;
- nature of the work being performed; and
- competencies and characteristics of the person working alone or in a remote location.

The employer has an obligation to provide a safe workplace as far as is practicable, but it is possible — despite the best of precautions — to become stranded in a remote location.

The chances of survival in a remote and harsh environment increase considerably if the following precautions have been taken:

- plan all trips and ensure someone else knows your plans;
- arrange a schedule of times to contact your base, and keep to that schedule;
- always set out with adequate supplies of the four basic requirements — water, shelter, warmth and food;
- take appropriate communications equipment such as maps, long-range or mobile satellite phone, global positioning system or radio beacon;
- ensure your vehicle is suitable for the terrain in which you will be travelling, that it has been adequately maintained, and that it has a dual battery system with both batteries in working condition;
- carry essential spare parts, tools, recovery equipment and a first aid kit;
- never leave the vehicle if it breaks down — it is easier to find a vehicle than a person;
- check on weather forecasts and road conditions before departure;
- read, understand and follow any company standards for remote travel; and
- ask to attend a survival course if you regularly work in remote areas.

Resources Safety has a Mine Safety Matters brochure on travelling in remote locations, and the Commission for Occupational Safety and Health has published *Working Alone — Guidance Note*, available on the Safetyline website at [www.safetyline.wa.gov.au](http://www.safetyline.wa.gov.au) or by telephoning 9327 8777.



# Potable water on mine sites

The question of the legal requirements for providing potable water on mine sites was raised during the recent Mines Safety Roadshow.

Stephen Turner, Resources Safety's Occupational Hygienist, says it is an obligation under the general duty of care for employers under the *Mines Safety and Inspection Act 1994* to provide drinking water to an adequate standard in order to ensure no detriment to the occupational health of employees.

Monitoring and testing must meet the National Health and Medical Research Council (NHMRC) guidelines for drinking water quality in Australia. The NHMRC publishes the *Australian Drinking Water*

*Guidelines*. This document is subject to a rolling-revision process that ensures the guidelines represent the latest scientific evidence in relation to good quality drinking water. The most recent guidelines were published in 2004.

In addition, Mr Turner said that regulation 7.8 of the Mines Safety and Inspection Regulations 1995 contains some requirements regarding provision of potable water.

Monitoring of the water quality on mine sites is an essential part of the environmental management of a mining and mineral processing operation according to the *Water Quality Protection Guidelines Number 5*, published in 2004 by the

Western Australian Department of Environment.

'This enables water quality and chemical containment performance to be assessed, and undesirable impacts to be detected at an early stage and remedied,' Mr Turner said.

The risk management process must be applied in ensuring the integrity of the water supply and the prevention of foreseeable contamination.

More information on the guidelines mentioned above is available from the NHMRC website at [www.nhmrc.gov.au/publications/synopses/eh19syn.htm](http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm) and the Department of Environment website, in the information for industry section, at [www.environment.wa.gov.au](http://www.environment.wa.gov.au)

# Protect your skin

Workers who cannot avoid exposure to the sun should take care to avoid the risk of skin cancer.

People whose jobs involve a lot of time in the sun are at high risk of developing skin cancers, and employers have a responsibility for minimising this hazard. Under workplace safety laws, employers have a duty of care to provide systems of work, information, training and personal protective clothing and equipment to protect employees.

Personal protective equipment could include long sleeves and trousers, enclosed footwear, wide-brimmed hats or hats with neck flaps, broad-spectrum sunscreen and eye protection.

Sunscreen should be layered on thickly to clean, dry skin (after a

shower is ideal) and renewed every two hours, or more frequently if a worker is sweating profusely. Where sunscreen is required, it should comply with the relevant Australian Standard, and any eye protection provided should also comply with the relevant Australian Standard.

Employees also have a duty of care to themselves and others in the workplace, and must comply with instructions and use the protective clothing and equipment provided.

Workers' tasks can also be rotated where possible so their time in the sun is minimised.

Further information on reducing the risk of skin cancer can be obtained by calling the Cancer Helpline on 13 11 20 or visiting the SunSmart website at [www.SunSmart.com.au](http://www.SunSmart.com.au)



Wide-brimmed hats, eye protection and long sleeves will all help protect your skin from the sun



# Underground Mine Emergency



The 2005 Underground Mine Emergency Response Competition was held at St Ives Gold Mine (Gold Fields Australia) near Kambalda where, after a closely fought battle, Placer Dome Kalgoorlie took out top honours from Oxiana Golden Grove and Barrick Lawlers.

The competition is an initiative of the Chamber of Minerals and

Energy (CME) Eastern Regional Council (ERC).

According to Resources Safety's Peter O'Loughlin, a District Mining Inspector who was a member of the CME organising committee and one of the chief adjudicators, the objectives of the competition include providing the opportunity for emergency

response teams to benchmark their standard of competency, equipment and skills against other teams.

The competition began on Friday, 17 November 2005, with an induction and briefing followed by a theory examination. The theory examination involved each team nominating their best theory person, while the five other team members sat a separate exam, where they were able to discuss answers and problem solving.

The competition scenarios, each an hour long, were held at the Sirius and Junction mines. Events included search and rescue, fire fighting, breathing apparatus skills, rope rescue, team safety and first aid. With all exercises being held underground, in trying conditions, the competition simulates as close to the real thing as possible.



Department of Consumer  
and Employment Protection  
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Labour Relations Division



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# Response Competition

As the sun set over the rugged beauty of the Goldfields country on Sunday evening, some 300 guests made their way to the Miners Hall of Fame for the announcement of this year's winners. Guests included Mr John Kobelke, Minister for Consumer and Employment Protection; Adam Wright, chair of the CME ERC; Martin Knee, State Mining Engineer; Brad Brierley, chair of the ERC Mine Rescue Competition committee; and Cory Atiyeh, General Manager of St Ives Gold Mine, which hosted this year's competition.

Before presenting the awards, Mr Kobelke congratulated the competitors and acknowledged their commitment and dedication.

He said that the State Government recognised that rescue volunteers spend much of their spare time training and being on call for any emergency that may arise.

'Just a telephone call can immediately bring into action courageous and highly trained miners who will do whatever it takes to rescue anyone, anytime.

'You are all incredible examples of those who follow the unwritten law of mining — that is, we always bring our mates out.'

*Right and opposite: Participants in the Underground Mine Emergency Response Competition are put through their paces in a series of simulated emergencies*

### Winners

Best team .....	Placer Dome Kalgoorlie
Team skills .....	Oxiana Golden Grove
Best new team .....	Lightning Nickel
Best captain .....	Darren Stralow, Barrick Lawlers
Search and rescue .....	Placer Dome Kalgoorlie
Fire fighting .....	South Kalgoorlie Mines
Breathing apparatus .....	Oxiana Golden Grove
Rope rescue .....	KCGM
Team safety .....	Placer Dome Kalgoorlie
First aid .....	Lightning Nickel
Overall first aid .....	Barrick Lawlers
Theory .....	South Kalgoorlie Mines
Individual theory .....	Aaron Van Der Swaagh, Lightning Nickel
Best scenario .....	First aid scenario
Host site award .....	North East Regional Team
Reserve award .....	Rodney Pool, Oxiana Golden Grove




Photos courtesy Michael Lovitt

## New-look Resources Safety website

Resources Safety's website has recently had a facelift. The site has been restructured, with an improved navigation system that allows users to get to the page they need in three clicks or less.

The new format will make it easier to access information on mines safety. Also keep an eye on the home page, where we post billboards advertising new material that has been added to the site.

Test-drive the new site yourself at [www.docep.wa.gov.au/ResourcesSafety](http://www.docep.wa.gov.au/ResourcesSafety)




# Ventilation in Western Australian mines

This is the first in a two-part series dealing with ventilation issues in Western Australian underground mines. The second part will examine the need for specialist ventilation training.

## Current status

The Australian mining industry is in the midst of major cultural change in how it thinks about safety, with changes most noticeable in mining methods, mining equipment and human resource policies.

According to Dr Rick Brake, one of Australia's most respected ventilation specialists, these changes will continue to challenge the Western Australian mining industry's approach to the design of underground mine ventilation systems.

A basic definition of mine ventilation is the science and practice of providing safe and healthy air for a mine. In his practitioner's training manual, Rick points out that this air is needed not only for mine workers but also mobile equipment, fixed plant and the rock or strata mass itself, as all three require a certain air quality to remain 'healthy'.

'It is also important to remember that it is not just the air that is 'breathed' by a person or machine that must be acceptable, but the air must also be sufficiently cool to avoid overheating

either humans or plant, and must be free of contaminants.

'Contaminants such as gamma radiation can damage a miner, dust collecting on machinery can damage moving parts, and humidity can cause steel to corrode or rock surfaces to deteriorate resulting in unsafe strata,' Rick said.

In addition, ventilation must reduce hazards associated with spontaneous combustion, gas outbursts or wind-blast, and provide means of refuge or egress for workers in the event of a fire or other unplanned event.

Ventilation-related issues have been at the core of numerous health and safety issues and most disasters in the industry in the past, including disease, outbursts, fires and explosions — in both coal and metalliferous operations. Recent respiratory and ventilation issues affecting other industries include asbestosis and, quite recently, silicosis.

In addition, diesel particulate matter (DPM), the very fine particles produced in diesel exhausts, is now classified by the International Agency for Research on Cancer (IARC) as a Class B carcinogen (known in animals and suspected in humans), and is the subject of numerous current investigations and enquiries. The July 2005 issue of *MineSafe* discussed DPM.

According to Rick, North America and Europe are spending large sums of money reducing DPM exposures, as are coal mines in Australia, many of which have relatively low DPM exposures compared to many hardrock mines.

'Australian hardrock miners are generally now behind the DPM control measures considered to be good practice in many overseas jurisdictions, and this could impact on health and safety and even increase exposure to litigation in the future,' Rick said.

He also believes a national code of practice should be developed regarding the measurement of diesel particulates in the workplace and acceptable exposure levels.

## Ventilation planning

According to Rick, mine ventilation planning remains very reactive and is often performing poorly in terms of providing a safe and healthy work environment at a reasonable cost.

'The short mine life of many operations in Australia has driven project economics towards minimising up-front capital costs, even if this results in higher operating costs.

'When combined with the trend away from prescriptive legislation, this has resulted in some operators taking short cuts and falling below industry good practice.

'The use of the surface ramp along with series ventilation of working sub-levels is one of these poor practices.

'Unfortunately, ventilation is frequently seen as a cost that adds little value to the business, and not as part of the mining process, and this leads to intense pressure to reduce ventilation costs.'

One Canadian study found that workers complained more to mines inspectors about ventilation than any other single topic.

'In my dealings with mine workers, ventilation is a major issue from health,



Photo courtesy Michael Lovitt

Ventilation must reduce hazards in underground mines



morale and productivity perspectives, and issues around ventilation are responsible for a significant amount of absenteeism and also contribute to turnover of staff. Mine workers actually see money spent on ventilation as money well spent and a key factor in their own health, safety and enjoyment on the job. After all, workers who believe management is serious about providing a safe and healthy workplace are more likely to be constructive and productive on the job and to stay with that employer, rather than moving elsewhere,' Rick said.

### Ventilation standards

Many Australian mines no longer conduct sufficient forward-thinking regarding the mine ventilation system, but simply keep extending the mine and the ventilation system until it is manifestly inadequate.

While some of the larger mining companies operating in Australia have introduced ventilation standards and also require a ventilation officer to be appointed on each mine site, many companies do not. According to Rick, if firm standards existed then planning and auditing would be required to ensure these can be maintained. Past safety performance or reputation is no guarantee that conditions are properly managed or the risks are acceptably low.

Ian Misich, a technical specialist with Resources Safety, echoes many of Rick's concerns.

In a joint paper presented at a mining conference last year, Ian pointed out that open pit and underground mines in Western Australia are getting deeper and larger, and are offering challenges to the commercial viability of mines and workplace safety.

'While there has been general acceptance of Western Australia's existing approach to regulating mines, there is room for improvement,' Ian said.

'Incidents are still occurring that potentially jeopardise the safety of mine personnel and sterilise the state's valuable finite resources.

'It is obvious that the best way to deal with these issues and to secure the



*Safe and healthy air is necessary for plant, as well as mine workers*

long-term viability of underground mining in Western Australia is through systematic research, investigation and, where appropriate, open discussion by all involved in the mining industry.'

Ian suggests that it is certainly time for the Western Australian mining industry to take a close look at ventilation issues.

The most common ventilation regime used in Western Australian mines is the so-called 'series' system, with the vast majority using series ventilation as the only system employed for the full life of the mine.

However, Ian warns that the weakness of this arrangement is the reliance on the re-use of potentially contaminated air through successive workplaces.

'If, for example, a major fire occurs in the principal intake airway, which virtually without exception in Western Australia is the decline, catastrophic pollution of downstream workplaces is a very real possibility,' Ian stated.

'It would therefore be sensible for companies to look at introducing a parallel system, which provides 'fresh' air to all workplaces and allows for all contaminated air to be quickly exhausted.

'While this involves increased cost, the risks associated with fire underground are much reduced by the parallel option.'

'Taken at face value, it is difficult to argue for more stringent control, and a view held by some in the industry — that risks related to underground

vehicle fires are effectively controlled by the measures in place and there is no cause for concern — illustrates this point,' Ian said.

According to Ian, it can be argued that the industry is a victim of the perception of its own success. However, the large number of underground fires reported each year demonstrates that we cannot take our eye off the ball for an instant, and we need to be sure that our control measures are adequate for all possible scenarios.

More than 30 percent of all incidents reported in underground mines under section 78 of the *Mines Safety and Inspection Act 1994* relate to fire, mainly on vehicles.

'With series ventilation, any fire underground is potentially a high-consequence event. The fact that no underground fatalities relating to fire have so far been recorded in Resources Safety's AXTAT database should afford no comfort — we could be heading for a major disaster,' Ian said.

'Mine designers should plan for change, and the processes need to be attuned to the general mining conditions as they evolve through the full life of a mine.

'The state can no longer afford for each mine in Western Australia to arrive at the optimal mine plan through 'the school of hard knocks'. The regulator and the industry must try to learn more from the experience of others and start planning and designing for the future now.'

# Resources Safety on the road

In October, Resources Safety travelled from the northwest to the south of Western Australia, taking the 2005 Mines Safety Roadshow to Karratha, Port Hedland, Newman, Kalgoorlie, Bunbury and Perth.

Resources Safety staff, including inspectors and the State Mining Engineer, were joined by WorkSafe inspectors and representatives of the Safety and Health Representatives Working Group to present information on recent legislative changes and

safety issues that affect the minerals industry.

There were almost 350 participants — about 35 in Karratha and Newman, 45 in Port Hedland, 50 in Bunbury, 75 in Kalgoorlie and 100 in Perth. Participants represented a range of industry perspectives, including safety and health representatives, occupational health and safety professionals, supervisors and managers. Safety and health representatives typically comprised about 50% of the audience at each venue, but the proportion was about 80% in Newman and 30% in Perth.

The topics covered were:

- legislative changes;
- roles and responsibilities
  - safety and health representatives (SHRs)
  - employees
  - employers;
- election of SHRs
  - election process
  - after the election
  - working together;
- safety and health committees
- issue of provisional improvement notices (PINs);

- communications strategies;
- reporting incidents and injuries in mining and exploration;
- electrical safety in mining; and
- access to Resources Safety information

There was also a workshop session on the issuing of PINs and associated matters. A consistent theme of the Roadshow was the importance of effective communication.

A number of topics were raised for inclusion in next year's Roadshow program, and some have been developed as articles in this issue of *MineSafe*.

In response to requests during the Roadshow, the presentations have been repackaged as PowerPoint presentations suitable for toolbox meetings, and can be downloaded from Resources Safety's website in the section on Mines Safety and Inspection Act resources.

Thank you to all those who participated in this event and provided valuable input that will help determine the subject matter of future resources produced by Resources Safety.



*Mines Safety Roadshow attendees in Karratha participating in a workshop session*

## Follow-up to Significant Incident Report No. 129

The July 2005 issue of *MineSafe* contained a significant incident report regarding the derailment and fall of an overhead crane in December 2004. The crane

manufacturer, NAI quip Pty Ltd, has advised the following outcome.

The company concerned decided to modify the crane as requested

to eliminate the possibility of the long travel wheels bouncing off the running rails. This entailed removing and re-installing the conductor power system to the bottom flange of the runway beam and fitting anti-lift brackets to the bogies.

The modifications have been in place since August this year, without affecting the crane's operational performance.

These anti-lift modifications have now been fitted on other cranes within the group on the recommendation of the company's safety committee.



*New 10 tonne NAI quip single beam crane*



*Anti-derailment devices fitted to LT bogies*

# Personal protective equipment — who is responsible?

Although the preferred safety control measures of elimination, substitution and engineering should be considered first, most workers — particularly in the resources sector — need to have at least some personal protective equipment (PPE) in order to do their jobs safely.

But technology and employment patterns are constantly changing in modern workplaces, and recent years have seen a substantial shift towards more casual employment, contracts, contracting out, labour hire and self-employment, part-time work, fly-in fly-out arrangements, home-based work and extended working hours.

Labour hire arrangements, in particular, have led to some confusion over who has responsibility for providing employees with PPE. This issue was raised during the recent Mines Safety Roadshow.

One of the important changes to the *Mines Safety and Inspection Act 1994* that came into effect in April 2005 provides for levels of protection for workers in labour hire arrangements equivalent to those for other workers.

The changes included an expansion of the general duties of care to ensure people in control of workplaces are responsible for the safety and health of those in their care, and they cover new ways of working such as labour hire arrangements.

The bottom line is that everyone involved in a labour hire arrangement has duties to ensure a safe workplace. The labour hire agency and the host both have the same responsibilities to ensure the safety of workers as employers, while workers in labour hire arrangements have the same responsibilities as employees.

Where it is not practicable to avoid the presence of hazards at the workplace, employees must be provided with adequate personal protective clothing and equipment to protect them against those hazards, without any cost to the employee.

The employee is also under an obligation to use the protective equipment provided and, as far as possible, to keep the equipment in good working order.

A labour hire company (or agent) does not normally have control over the day-to-day work done at the workplace, but its responsibility does not stop because the work is not being carried out at its workplace.

The labour hire company has responsibility for areas such as:

- verifying and matching the training, skills and experience of the worker to the needs of the task;
- providing general induction, and ensuring that specific induction is provided in relation to the tasks and machinery in the workplace;
- ensuring that changes in duties do not present hazards to the worker;
- providing information and training to ensure the worker knows how to carry out tasks safely;
- ensuring the work environment is safe, and that on-site supervision is provided;
- ensuring the work of other employees does not harm the safety and health of the labour hire worker; and
- reporting notifiable injuries and diseases.

A labour hire worker's host also has responsibilities, including:

- ensuring the work environment is safe;
- providing specific induction, information and training to ensure the worker knows how to carry out the duties safely;
- notifying the labour hire company if any changes are being considered;
- providing adequate on-site supervision;
- ensuring the work of other employees does not harm the

safety and health of the labour hire worker; and

- reporting notifiable injuries and diseases.

There are also actions that should be undertaken jointly, with the agent and host consulting with each other. These include:

- identifying hazards in relation to tasks and assessing the risks prior to the placement of a worker;
- understanding the obligations of how to deal with hazards;
- considering and implementing control measures to ensure a safe work environment;
- ensuring personal protective equipment is provided at no cost to the worker; and
- providing on-site training and induction, and resolution of issues procedures.

The provision of PPE at no cost to labour hire workers is an issue that needs to be agreed upon by the agent and host in consultation, preferably before the worker commences.

At no time can employers contract out their responsibilities for occupational safety and health.

Workers in labour hire arrangements have the same general duties of care as any other employee — all workers must take reasonable care of their own safety and health and that of others in the workplace.

## Clarification

Page 10 of the September 2005 issue of *MineSafe* featured a photograph of an overturned dozer. This photograph was used for illustrative purposes only. It depicted a simulated incident from a mines rescue competition, and did not relate to any of the incidents listed in the accompanying article.



# Uranium — the new gold?

Ivan Fetwadjieff, a Senior Scientific Officer with Resources Safety, was one of 300 delegates who attended the Australian Uranium Conference held in Fremantle on 11–12 October 2005.

With world uranium prices at record levels, there was a high level of interest in the conference — particularly as the Federal Government has put the matter of uranium mining back on the political agenda.

According to Ivan, Mr Ian McFarlane, the Federal Minister for Industry, Tourism and Resources, told delegates that he had a vision to see Australia as the world's largest exporter of uranium.

Mr Martin Ferguson, the Federal shadow minister, had a similar vision.

'They both see uranium mining as an opportunity to boost Australia's economic growth and a way of promoting clean energy to China and India, which have 45% of the world's population, 48% of the world's energy consumption and 48% of the world's global greenhouse emissions,' Ivan said.

China has nine of the most polluted cities in the world due to the use of brown coal for power generation.

'As greenhouse and global warming concerns increase, there is a growing

interest in the need for a low-emission fuel source to combat climate change, and both speakers said they saw Australia as being well positioned with solutions. Being a major player, this could dictate stringent controls on the use of uranium.'

Currently, Australia provides about 22% of the world's uranium and has 30% of the world's economic uranium resources. Current uranium exports are worth A\$425 million annually.

This equates to 10,500 tonnes of uranium oxide concentrate, avoiding 400 million tonnes of CO<sub>2</sub> being produced from coal.

Mr Fetwadjieff said that several uranium exploration companies gave presentations revealing a tremendous increase in interest in uranium exploration.

'After some 25 years in the doldrums, speakers said the industry is undergoing a major resurgence worldwide. In Western Australia, there are about 40 companies planning to start exploration or drilling programmes, and there are 70 companies actively exploring and likely to spend around A\$26 million. The speakers described uranium as the new gold.'



*Western Australian legislation requires strict monitoring of radiation by uranium exploration companies*

Mr Fetwadjieff said that, prior to any of these companies commencing their exploration activities, they must meet strict requirements under Western Australian legislation. This includes the submission of a radiation management plan to Resources Safety, and the employment of a competent Radiation Safety Officer to train staff and monitor radiation exposures.

Once work begins, radiation exposures must be recorded using dust monitoring equipment and radiation exposure badges. Drilling equipment must have good dust control and workers are required to wear appropriate respirators.

Companies are required to report their radiation monitoring results to Resources Safety annually.

With regard to the storage of radioactive cores and samples, explorers should contact the Radiation Health Branch of the Western Australian Department of Health (ph. 9346 2260, fax 9381 1423, email radiation.health@health.wa.gov.au), which regulates storage facilities under the *Radiation Safety Act 1975*.

For more information on the legislative requirements for uranium explorers, contact Ivan Fetwadjieff (ph. 9222 3376, fax 9325 2280, email ifetwadjieff@docep.wa.gov.au).



*Australian uranium exports are currently worth A\$425 million annually*

# Radiation safety publications

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has taken over responsibility for the administration of the former NHMRC Radiation Health Series publications and for the codes developed under the *Environment Protection (Nuclear Codes) Act 1978*. The publications are being progressively reviewed and republished as part of the Radiation Protection Series (RPS).

The ninth in the series, *RPS 9 – Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing*, was published in August 2005.

The code establishes requirements for radiation protection in mining and mineral processing industries, and for protection of human health and the environment from the effects of radioactive waste from mining and mineral processing. It is intended that these requirements will be adopted by Commonwealth, state and territory jurisdictions. The safety guide provides best practice guidance on achieving compliance with the requirements set out in the code.

This code will be put forward to be adopted nationally into regulatory frameworks by its inclusion in Schedule 11 of the National Directory of Radiation Protection (NDRP). The NDRP provides an agreed framework

for radiation safety to be adopted by the Commonwealth, states and territories.

Printed copies of publications in the Radiation Protection Series are available for sale directly from ARPANSA. Printed copies of the Radiation Health Series are also available (free of charge) subject to availability. Electronic versions of all publications are available from ARPANSA's website at [www.arpansa.gov.au/codes.htm](http://www.arpansa.gov.au/codes.htm)

For further information, contact:  
Secretariat, ARPANSA  
619 Lower Plenty Road  
Yallambie VIC 3085  
Tel: 1800 022 333  
Fax: (03) 9433 2353

## What is MIAC?

The Mining Industry Advisory Committee (MIAC) was established in April 2005 under section 14A of the *Occupational Safety and Health Act 1984* as an advisory body on matters relating to occupational safety and health in the mining industry.

MIAC replaces the Mines Occupational Safety and Health Advisory Board (MOSHAB).

The functions of MIAC are to:

- advise and make recommendations to the Minister for Consumer and Employment Protection, the Minister for State Development, and the Commission for Occupational Safety and Health on occupational safety and health matters concerning the mining industry;
- liaise with the Commission to coordinate activities on related functions and to maintain parallel standards;
- inquire into and report to the Ministers regarding any matter

referred to it by the Ministers relating to occupational safety and health in the mining industry;

- make recommendations to the Ministers regarding the formulation, amendment, or repeal of laws relating to occupational safety and health;
- prepare or recommend the adoption of codes of practice, guidelines, standards, specifications or other forms of guidance for the purpose of assisting employers, self-employed persons, employees, manufacturers or other persons to maintain appropriate standards of occupational safety and health in the mining industry; and
- provide advice on education and publications, and training and training courses, with respect to occupational safety and health in the mining industry.

The membership is appointed by the Ministers and is tripartite in its composition, ensuring representation from industry, unions and government.

The current members are:

Brian Bradley (chair) — Director General, Department of Consumer and Employment Protection  
Rob Watson — Chamber of Minerals and Energy WA  
Nicole Roocke — Chamber of Minerals and Energy WA  
Gary Wood — Unions WA  
Henry Rozmianiec — Unions WA  
Martin Knee — Resources Safety  
Kathryn Heiler — Expert Member

With the exception of the chair, all members of the MIAC hold office for a term not exceeding three years and are eligible for reappointment.

The first meeting of the MIAC took place on 25 October 2005, with further meetings scheduled for the third Monday of every second month.

## Safety and health representatives section

### Ask an inspector

Jim Boucaut has been with Resources Safety (in its present and previous guises) for more than 25 years so, in recognition of achieving this significant milestone, he was asked recently about his thoughts on safety in the mining industry.

Jim has been Senior Inspector of Mines and Regional Mining Engineer in Kalgoorlie for 15 years and, with over 30 years of experience in the mining industry, is certainly in a position to suggest that sometimes it could be good safety practice to reflect on the outcomes of the past in order to make improvements for the future.

He is full of praise for the enormous changes he has seen in the safety performance of the mining sector — a change he says is demonstrated in the greater awareness of employers and employees to maintain a safe working environment.

Jim has seen great improvements in safety training, the introduction of safety management systems onto mine sites, and the increasingly important role that safety and health representatives and committees are now playing in mining companies. He notes that the safety and health representatives have proved to be very valuable assets in matters relating to safety and health in the workplace.

However, there is one issue that does concern him — the number of accidents that recur involving on-highway vehicles, such as water trucks, losing control on pit ramps. While an investigation is carried out at the particular site and steps are taken to prevent a similar incident, what he is seeing is that, over time, there is a pattern of this type of accident happening again.



*Jim Boucaut, Senior Inspector of Mines and Regional Mining Engineer in Kalgoorlie, who recently celebrated his 25th year with Resources Safety*

He puts this down to the fact that there is a fairly high turnover in the mining sector. People involved in, or knowing about, the incident may leave, and the knowledge and experience of that accident goes with them.

Jim says that he has been giving some thought to how companies can overcome this pattern and, according to him, a trip back in time and history could be the answer. He believes it would be of great benefit for mining companies and safety practitioners to look at past safety bulletins, hazard registers and even go back through *MineSafe* magazines to get an appreciation of what has happened before, and use this information to review work practices at their sites to stop it happening again.

He also suggests visiting Resources Safety's website as another valuable source of information.

Jim believes that these actions will help maintain safety knowledge and keep companies and practitioners at the cutting edge.

*Congratulations Jim on achieving your 'silver anniversary' and thank you for sharing your thoughts on mine safety.*

### New resources

Resources Safety has two new resources available for people in the mining industry with an interest in safety and health.

The first is a poster on the election of safety and health representatives. It features a flow-chart showing the steps in the election process, providing an overview of the legislative requirements for conducting elections.

The other item now available is a series of toolbox PowerPoint presentations. These are based on material presented at the Mines Safety Roadshow, and have been repackaged as smaller individual presentations suitable for use in the workplace.

These and other resources are available on the Resources Safety website at [www.docep.wa.gov.au/ResourcesSafety](http://www.docep.wa.gov.au/ResourcesSafety), by telephoning 9222 3229, or by emailing [ResourcesSafety@docep.wa.gov.au](mailto:ResourcesSafety@docep.wa.gov.au)



### Keep us informed

To keep our safety and health representative contact list up-to-date, please advise Julie Steven in Resources Safety (ph. 9222 3438, fax 9325 2280, email [jsteven@docep.wa.gov.au](mailto:jsteven@docep.wa.gov.au)) if you are no longer a safety and health representative, but also let her know if you would like to remain on our mailing list to receive *MineSafe*.



# Supporting safety and health representatives

It is accepted that competent and well-motivated safety and health representatives (SHRs), provided with training, support and encouragement, will add value to the minerals industry by assisting in the industry's approach to reducing incident and injury rates and eliminating fatalities.

Over the last two years there has been an increase in the number of SHRs completing the mandatory introductory SHR training course.

However, there is still more to be done to clarify roles and responsibilities, and provide support, training and resources to address the issues of attracting and retaining SHRs.

Recognising the vital role of SHRs in improving safety and health in the workplace, the Mining Industry Advisory Committee (MIAC) has endorsed an ongoing role for the Safety and Health Representatives Working Group.

Originally created in 2003 under the auspices of the Mines Occupational Safety and Health Advisory Board (MOSHAB), the SHRs Working Group was formed to consider and report on strategies to enhance the role of and participation by safety and health representatives in the Western Australian minerals industry.

As a result of the discussions of this working group, activities have been undertaken by Resources Safety to address these issues.

### Survey

A survey was completed in March 2005 by 150 SHRs from the minerals industry to help identify the training, information and communication needs of SHRs.

Valuable feedback was obtained on:

- why employees became SHRs;

- the level of support for SHRs in the workplace;
- the types of information SHRs would like access to; and
- how SHRs would like to receive this information.

The main points from the survey are summarised below.

- The two main reasons survey participants said that they became an SHR were an interest in increasing their knowledge about safety issues and a desire to use their knowledge to make their workplace safer.
- The best aspects of being an SHR were the ability to make a difference and the satisfaction of being able to help others.
- The worst aspect was said to be the lack of respect by some of their colleagues, particularly those who won't change their work safety practices.
- Needs that SHRs want addressed are more feedback and cooperation from management, and more time allocated to the SHR role.
- However, the majority of SHRs reported that fellow workers were generally supportive of the things they tried to do and that management was broadly supportive of their role.
- The types of information required by survey participants were material safety data sheets, information about the role and responsibilities of an elected SHR, hazard identification techniques and incident investigation techniques.
- Some SHRs were not being provided with the opportunity to attend the introductory training course.
- Refresher courses were needed periodically.

This feedback is now being used by the SHRs Working Group to plan activities for 2006.

### Mailouts

Resources Safety pamphlets and posters have been sent to SHRs throughout 2005, with some 1,800 SHRs currently on the mailing list.

These mailouts have included material on the role and responsibilities of SHRs, potential workplace hazards and the process involved in issuing a provisional improvement notice.

### Contact database

One of the problems identified by the SHRs Working Group regarding providing information is the lack of up-to-date contact details for some elected SHRs. If you are an elected SHR and have not received any of the mailouts, please contact Julie Steven (see 'Keep us informed' — opposite page).

### Future work program

At its next meeting early in 2006, the SHRs Working Group will be discussing:

- ways to enhance the interaction between the regulator and SHRs;
- maintaining the contact database for SHRs;
- additional publications for SHRs;
- 2006 Mines Safety Roadshow; and
- ongoing communication and networking opportunities for SHRs.

Further information on these will be provided regularly in *MineSafe*. Alternatively, contact Anita Rudeforth, Senior Policy Officer with Resources Safety, on 9222 3386 or email arudeforth@docep.wa.gov.au for more information.

# Occupational Safety and Health Tribunal

Legislation to bring about major changes to the *Occupational Safety and Health Act 1984* (OSH Act) and the *Mines Safety and Inspection Act 1994* (MSI Act) passed through the Western Australian Parliament in November and December 2004, respectively. As part of these changes, the newly established Occupational Safety and Health Tribunal came into effect on 4 April 2005.

## What is the Occupational Safety and Health Tribunal?

The Occupational Safety and Health Tribunal is a specialist body established to deal with some administrative matters under the OSH and MSI Acts. Matters include appeals against the decisions of the WorkSafe Commissioner and the State Mining Engineer — for example, in relation to reviews of notices. Many of the functions to be carried out by the Tribunal were previously dealt with by safety and health magistrates.

The Tribunal operates under the auspices of the Western Australian Industrial Relations Commission (WAIRC). Under the approach adopted, a single Commissioner of the WAIRC, with appropriate occupational safety and health expertise, has been appointed to hear the relevant matters. This Commissioner also performs functions as a member of the WAIRC under the *Industrial Relations Act 1979* (IR Act), as well as the specific functions under the OSH and MSI Acts.

Prosecutions will continue to be dealt with by safety and health magistrates in the Magistrates Court of Western Australia.

It is recognised that the WAIRC Commissioner appointed to the Tribunal cannot always be available to hear a matter. To address this issue, the changes also provide for another member of the WAIRC to hear matters when necessary.

The establishment of the Tribunal gives effect to a number of significant recommendations arising from the statutory review of the OSH and

MSI Acts, undertaken by Mr Robert Laing, formerly a Commissioner of the Australian Industrial Relations Commission.

## What claims go to the Tribunal?

Matters that may be referred to the Tribunal include administrative matters that were previously dealt with by a safety and health magistrate and some other matters that arise under the changes to the OSH and MSI Acts. The Tribunal will hear appeals and related OSH Act and MSI Act matters, including:

- the review of a decision by the WorkSafe Commissioner or the State Mining Engineer as to whether a safety and health committee is to be established;
- the review of a decision by the WorkSafe Commissioner or the State Mining Engineer in relation to a variation of a safety and health committee;
- the review of a decision by the WorkSafe Commissioner or the State Mining Engineer on the review of a prohibition or improvement notice;
- a question relating to an election for a safety and health representative (SHR) that the WorkSafe Commissioner or the State Mining Engineer have been unable to resolve;
- a question as to whether an SHR should be disqualified;
- a determination of a variation of entitlements to time off work with pay or the payments for attendance at a course of training in the SHR's own time; and
- a 'discrimination' claim by an SHR.

The Tribunal has jurisdiction to hear certain matters together. This applies where one is an unfair dismissal claim before the WAIRC in accordance with the IR Act and the other is one of the matters specified in the OSH Act or the MSI Act that may be referred to the Tribunal.

For some matters, conciliation is available if the Tribunal considers it appropriate.

## Will there be a right to legal representation before the Tribunal?

Yes, there is a right to legal representation.

## How do I make an application to the Tribunal?

The Tribunal shares a website, reception counter, and hearing rooms with the WAIRC, which is located at:

16th Floor, 111 St George's Terrace,  
Perth, WA 6000  
Ph. (08) 9420 4444  
Free call for country callers 1800 624 263  
Fax 9420 4500

A matter is referred to the Tribunal by completion of a Notice of Referral to the Occupational Safety and Health Tribunal, which can be obtained directly from the WAIRC by phone or fax or [www.wairc.wa.gov.au](http://www.wairc.wa.gov.au) (follow the links to Applications and then Forms).

In the case of a referral to the Tribunal of a decision of the WorkSafe Commissioner or the State Mining Engineer, upon review of a prohibition or improvement notice, the Notice of Referral to the Occupational Safety and Health Tribunal must be filed at the WAIRC within seven days of the issue of the decision.

## Can the decision of the Tribunal be appealed?

A decision of the Tribunal can be appealed to the Full Bench of the WAIRC.

The appeal must be instituted within 21 days of the decision against which the appeal is brought.

An appeal is instituted by filing a Notice of Appeal to the Full Bench. The form can be obtained directly from the WAIRC or downloaded from [www.wairc.wa.gov.au](http://www.wairc.wa.gov.au) (follow the links to Applications and then Forms).

# 2005 MINEX Awards

The National Minerals Industry Excellence Awards for Health and Safety (MINEX), run by the Minerals Council of Australia, was introduced in 1995 to help the minerals industry reinforce its commitment to occupational safety and health, and it has become the industry's top award for excellence in safety and health.

Applications are evaluated against a comprehensive set of criteria:

- leadership — the role leadership plays in improving safety and health;
- safety and health management — the way management plans are developed and implemented;
- people — the extent to which people are involved;
- information and analysis — the way information is collected, analysed and used;
- safety and health processes — the processes used to manage safety and health; and
- performance — the site's performance and use of performance indicators.

The 2005 MINEX Award has been won by Pajingo gold mine, near Charters Towers.

Mitchell Hooke, the Minerals Council of Australia's chief executive officer, said that Pajingo's winning features were its mature safety culture based on a systematic approach to operational risk management, empowerment and engagement of its employees, training and the adoption of best practice.

'It is impressive that this is based on a "social licence to operate standard" and a "health safety environment community" risk management strategy that is well understood.'

Rio Tinto's Pilbara Rail in Western Australia received a highly commended gong at the MINEX awards.

Pilbara Rail transports about 134 million tonnes of iron ore annually



Photo courtesy Michael Lovitt

*The Minerals Council of Australia's MINEX Award encourages excellence in mining safety and health*

from seven mines to four unloading facilities for shipment — two at Dampier and two at Cape Lambert.

The judges noted that Pilbara Rail had regular auditing of a structured safety and health management system, and had integrated risk management into all activities.

The judges also recognised two coal mining sites — Roche Thies Linfox's Yallourn mine in Victoria and Xstrata Cola's Bulga operations in the Hunter Valley, New South Wales.

Of the Yallourn operation, the judges stated they were impressed by

significant achievement in safety and health performance driven by leadership and commitment on all levels of the operation at a time of organisational change.

At Bulga, they recognised the company's leadership, which they said actively seeks a strong safety culture strengthened by a high level of commitment at all levels of the operation and an improved safety performance.

For more information on the MINEX Awards, visit: [www.minerals.org.au/safety/minex](http://www.minerals.org.au/safety/minex)

## 2006 Occupational Safety and Health Conference

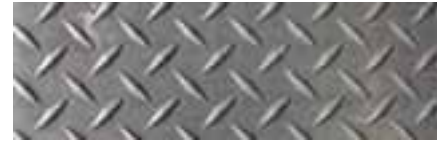
The Chamber of Minerals and Energy Western Australia is inviting people in the mining industry to attend the 2006 Occupational Safety and Health Conference, at the Sheraton Hotel, Perth, on 13 and 14 March 2006.

The conference theme is *Delivering outcomes — a case for safety*, and topics for discussion include:

- risk management techniques that can add value;
- industry initiatives to improve safety performance; and
- practical application of risk assessment.

For more information about the conference, visit [www.cmewa.com](http://www.cmewa.com) or telephone 9220 8509.





# Safety bulletin

All bulletins and reports are available online at [www.docep.wa.gov.au/ResourcesSafety](http://www.docep.wa.gov.au/ResourcesSafety) in the Mining Safety and Health section

Safety Bulletin No. 74  
Released 28 November 2005

## Explosive gases associated with mining

### Hazard

Numerous gases are associated with mining and are generally divided into combustible, toxic and asphyxiant types. Some of the more common gases encountered are methane, carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), oxides of nitrogen (NO, NO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S) and sulphur dioxide (SO<sub>2</sub>).

Methane is the most common combustible (explosive) gas. It is lighter than air, odourless and explodes at concentrations between 5% and 15%.

Gases are often detected during underground development and from both surface and underground diamond drilling. The effects of a gas explosion can be severe. In South Africa, multiple fatalities involving 25 deaths over a 10 year period have occurred as the result of methane explosions in the gold mining industry. While there has been no recent loss of life in Western Australia, fires, equipment damage and loss of production have resulted from methane intersections.

### Contributory factors

Although gas occurrences continue to be reported to Resources Safety, the inspectorate has become increasingly

concerned about recent notifications that have resulted in fires and the burning of gases.

In one case, a flame about one metre high coming from the muckpile was noticed during bogging operations in an underground development heading. In another case, a drill hole caught fire at a surface diamond drilling operation after methane was intersected. Flames were observed at the drill hole and extended to the top of the drill mast. The fire continued to burn for about 24 hours.

A few years ago, flammable gas exploded in an underground stope void. The gas was believed to have built up in the unventilated stope prior to the incident.

Further information on underground gas explosions can be obtained from *Significant Incident Reports Nos 85* (1997) and *102* (1999).

### Recommendations

All gas inflows at a mine should be treated as potentially hazardous until proven otherwise.

It has been determined that certain mineralogy may indicate the presence of gases. As such, geological data should be reviewed to ascertain if the strata intersected have the potential to release gases.

Operators and supervisors should be trained in the proper use of monitoring devices for gases that could be encountered, the hazards associated with those gases and the precautions to be taken in the event of an emission of gas.

The safe work practices developed for an outburst of gas should address as a minimum requirement:

- the types of gases that could be detected and the hazards associated with those gases;
- the need for adequate ventilation underground to dilute any gases encountered, especially at drill sites;
- notification of supervisors, underground manager, ventilation

officer and the emergency response team, if necessary, when gases are detected;

- evacuation of the area;
- isolation of electrical installations and diesel equipment;
- prohibition of smoking and naked flames;
- barricading of areas likely to be affected;
- development of blow out procedures; and
- conditions for re-establishing work under regulation 10.12 of the Mines Safety and Inspection Regulations 1995 (MSIR).

Regulation 9.29 of the MSIR outlines duties and requirements relating to the monitoring of toxic, asphyxiant and explosive gases in mines, while rr. 9.11(3) and 9.14 detail requirements for minimum oxygen content and general air supply in underground workplaces.

A range of monitoring devices is available to detect many of the gases commonly intersected in mine workings. In particular, devices to measure the oxygen level stipulated in r. 9.11(3) and the methane level in r. 9.29(3) are readily available. There are also devices that detect the presence of other gases such as carbon dioxide, carbon monoxide, nitrogen dioxide, hydrogen sulphide and sulphur dioxide.

The recognised gas hazards associated with diamond drilling indicate that suitable monitoring devices should be available at such working areas to detect the presence of dangerous gas emissions.

The ventilation officer has specific duties under r. 9.5(a) of the MSIR to regularly inspect workplaces throughout the mine. Drill sites should be included in the regular inspection program.

Managers of mine sites are reminded of their obligation to report to Resources Safety all outbursts of gas that are potentially harmful. This includes gases encountered during mining-related activities.