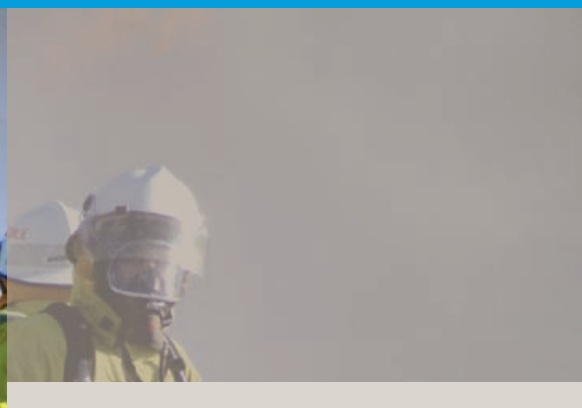
# MineSafe

Western Australia



## Comment sought on safeguarding code



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Department of **Consumer and Employment Protection**
Government of **Western Australia**

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Resources Safety

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

Main cover photograph: TYC

# In this issue

This is the second of three issues of *MineSafe* to be published in 2008. It starts with the regular section by State Mining Engineer Martin Knee, who discusses the safety issues associated with shutdowns for maintenance. He also advises on the obligation to maintain the quality of drinking water on mining operations.

At both state and national levels, much is happening in regard to the regulation of occupational safety and health, and we highlight a few of the reviews that may impact on Western Australia. Some of activity is specific to mining, such as the Kenner Review and National Mine Safety Framework. Although general in nature, the National Review into Model Occupational Health and Safety Laws has significant implications for mining.

Earlier this year, the Surface Mine Emergency Response Competition was held in Kalgoorlie. We report on the results and some of the work that goes into making this competition an important and integral feature of the mining calendar.

Information from the WorkSafe and Energy Safety Divisions of the Department of Consumer and Employment Protection (DOCEP) is included in relation to forklift usage and 'live' electrical work.

On the publications front, we review the guidance note on alcohol and other drugs in the workplace, and there is an invitation to comment on a draft code for safeguarding, another joint publication. WorkSafe has also launched a safe design code of practice, which is currently under consideration by the Mining Industry Advisory Committee.

'Where do we start?' is a common query when discussing a successful safety culture. An important aspect is to ensure effective consultation, communication and collaboration between management and workers. Information abounds on how this might be achieved. The 'Digging Deeper Wran Consultancy Project' was commissioned by the New South Wales government, and that state's Mine Safety Advisory Council is overseeing implementation of the recommendations through education programs. This includes developing a range of resources to foster effective working relationships, which may interest Western Australian operations – and saves 'reinventing the wheel'.

Continuing the safety culture theme, a Queensland study is looking at changing human behaviour to help prevent accidents. It is supervised by Dr Scott Shappell, a world expert in human behaviour factors, systems safety, error management and accident investigation. We hope to provide updates on this and the 'Digging Deeper' project as they become available.

In the new section on healthy active workplaces, find out about the world record attempt for 'The Giant Walk', explore some tools to help create and maintain a health active workplace, and read about Dr Tim Crowe's ideas on healthy living.

Resources Safety recently hosted Cassie Prideaux, the inaugural recipient of the Jim Torlach Scholarship. Find out what is involved in this scholarship scheme, and how Cassie is contributing to occupational health strategies to address risks associated with welding fumes. Other topics covered in the occupational health theme include asbestos exposure during mining, the review of hazardous manual tasks, and managing noise to conserve hearing. Safe Work Australia Week gets underway in October and readers are encouraged to let us know if they are involved in any events or activities.

We are currently verifying the database of safety and health representatives and, as part of that review process, an eForm has been developed to assist in the notification of election results. Also in the safety and health representatives section, there is an update from WorkSafe on the Certificate III in Occupational Health and Safety, which is optional for representatives undertaking the introductory training.

Much is happening in terms of DOCEP events later this year, including the Dangerous Goods Safety Roadshow Series 2, Mines Safety Roadshow, Perth Work Safe Forum and inaugural Exploration Safety Roadshow. In a first for Resources Safety, we will be trialling participation at remote sites via video conferencing as an option for the Exploration Safety Roadshow. Let us know if you are interested.

The significant incident report on the failure of an escape ladderway in an underground rise lists a number of preventative actions to address potential corrosion problems.

Enjoy your reading.

**Malcolm Russell**
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# Shutdown safety

We all know that shutdowns for maintenance are a fact of life. Some work simply cannot be done while plant is running and, over a period of time, jobs build up. Some critical parts may need to be changed out before they reach the end of their assured useful life, and consumable elements such as bearings or liners may need replacement to avoid the costly downtime inherent in breakdown maintenance.

Shutdowns have a few elements that make them very different from the normal day-to-day operation.

- They are of relatively short duration and they have cost and time constraints. This means that a lot of activity has to be compressed into small spaces and short timeframes.
- They have high peak resource requirements and there are large numbers of interrelated tasks. This means that large numbers of supplies, equipment units and personnel are on-site with very little room to manoeuvre and very little local knowledge of the environment, processes and systems.
- Equipment is opened up that is normally inaccessible and safety features such as guards, handrails and floor sections are frequently removed for access reasons. Often, work will have to be carried out from temporary (scaffold) structures and at heights that are not part of the day-to-day operating norms. This means that hazards such as exposure to stored energy (e.g. compressed air, gas accumulators), live electrical contact or toxic or asphyxiant gases, the potential for contact with hot parts and the risk of falls from a height can all come into play where they would not normally be of concern due to the usual configuration of the area and the provision of safety devices to prevent problems.

There is massive potential for things to go wrong because everyone is out of the comfort zone of what is normal and expected, and this is coupled with the pressures to get operations back to normal as soon as possible.

Perhaps one example will suffice to explain how out-of-the-ordinary operations can result in a bad outcome.

*An electrical generating plant was to be shut down for routine maintenance. It was decided to take advantage of this shutdown to determine whether, in the event of a loss of station power, the slowing turbine could provide enough electrical power to operate the emergency equipment until the diesel emergency power supply became operative. The aim of this test was to determine whether cooling could continue to be assured in the event of a loss of power.*

*This type of test had been run during a previous shutdown period, but the results had been inconclusive, so it was decided to repeat it. Unfortunately, this test, which was considered essentially to concern the non-operational part of the power plant, was carried out without a proper exchange of information and coordination between the team in charge of the test and the personnel in charge of the operation and safety of the generating station. Therefore, inadequate safety precautions were included in the test programme and the operating personnel were not alerted to the operational safety implications of the electrical test and its potential hazards.*

*The planned program called for shutting off the emergency water-cooling system. Although subsequent events were not greatly affected by this, the exclusion of this system for the whole duration of the test reflected a lax attitude towards the implementation of safety procedures.*

*As the shutdown proceeded, the generating system was operating at about half power when the electrical load dispatcher refused to allow further shutdown, as the power was needed for the grid. In accordance with the planned test program, about an hour later the emergency cooling system was switched off while the generating train continued to operate at half power. It was not until much later that the grid controller agreed to a further reduction in power.*

*For this test, the generating train should have been stabilised at a suitable output prior to shut down but, due to operational error, the power fell off to about 3% of this optimal level, which caused a change in operating characteristics. The operators then tried to raise the power to 70-100% of optimal level by switching off automatic regulators and taking manual control of some systems. It was only about two hours later that the generating train was stabilised at about 20% of the correct capacity.*

*Although there was a standard operating order that a minimum level of system controls were necessary, in the test only 20-25% of the control capacity was actually used. Many of the control devices were withdrawn to compensate for conditions during the test that reduced power. This meant that if there were a power surge, about 20 seconds would be required to engage the correct controls and shut the generator train down. In spite of this, it was decided to continue the test program.*

*There was an increase in coolant flow and a resulting drop in steam pressure. The automatic trip that would have shut down the generator train when the steam pressure was low had been circumvented. In order to maintain power, the operators had to withdraw nearly all the remaining controls. The system became very unstable and the operators had to make adjustments every few seconds, trying to maintain constant power.*

*At about this time, the operators reduced the flow of feedwater to maintain the steam pressure. Simultaneously, the pumps that were powered by the slowing turbine were providing less cooling water to the system. The loss of cooling water exaggerated the unstable conditions by increasing steam production in the cooling channels, and the operators could not prevent an overwhelming power surge, estimated to be 100 times the nominal power output.*

*The sudden increase in heat production ruptured part of the plant and small hot particles, reacting with water, caused a steam explosion, which destroyed part of the plant. A second explosion added to the destruction two to three seconds later.*

Not a major problem? Certainly not – as long as the plant was not called Chernobyl, as in this case!

# Quality of mine site drinking water

On 10 July 2008, State Mining Engineer Martin Knee sent the following advice to all registered managers of mines, exploration managers and exploration contractors.

The advice was provided as a follow-up and update on a memorandum circulated to industry in February 2000, advising of requirements in relation to drinking water quality.

Where mining companies and mining operators provide drinking water to employees (and in some cases also to associated communities), there is an obligation to:

- comply with *Guidelines for Drinking Water Quality in Australia 2004*, as published by the National Health and Medical Research Council; and
- provide results of routine monitoring of such water supplies to the Western Australian Department of Health.

Monitoring normally involves chemical and microbiological analysis of the drinking water.

Further information on the issue is available from the Secretary of the Advisory Committee for the Purity of Water, Mr Richard Theobald (telephone 08 9388 4967, fax 08 9388 4905).

The guidelines can be downloaded from http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm.

This is an important issue in relation to occupational (and community) health, and employers in the industry who supply drinking water should exercise due diligence in the process.

All new mining operations will be reminded of these requirements during the project approval process.

## Reviewing OSH

Currently, there are a number of reviews being conducted relating to occupational health and safety that affect the mining industry.

### Kenner Review

The first is the statutory review of the *Mines Safety and Inspection Act 1994* being conducted by Commissioner Stephen Kenner. This review was reported in the December 2007 issue of *MineSafe* (volume 16, number 3). Submissions from a variety of interested persons and representative organisations were received. A report on the review is currently being prepared by Commissioner Kenner for the Minister for Employment Protection.

### National Mine Safety Framework

The National Mine Safety Framework (NMSF) was established as an initiative of the Ministerial Council on Mineral and Petroleum Resources. Initial development of the Framework was undertaken by the Chief Inspectors of Mines. It includes a set of legislative principles as the basis for achieving national consistency in relation to mining regulation.

There are seven strategies, focussed on key areas where consistency across jurisdictions would be most beneficial:

- nationally consistent legislation;
- competency support;
- compliance support;
- a consistently applied enforcement protocol;
- effective data collection and analysis;
- consistent approaches to consultation; and
- a strategic approach to research

The development and implementation of the Framework is now guided by the tripartite NMSF Steering Group, established by the Ministerial Council. The NMSF Steering Group comprises State, Northern Territory and Australian Government officials, key trade unions and industry associations, and is assisted by a secretariat that sits within the Australian Government Department of Resources, Energy and Tourism.

Public consultation was undertaken in Perth, Sydney, Hobart and Brisbane in July and August to commence work on the final four strategies of the Framework:

- competency support;
- compliance support;
- a consistently applied enforcement protocol; and
- a strategic approach to research.

For further information on the consultation process, visit www.ret.gov.au/minesafety or contact the NMSF Secretariat:

**Telephone:** 02 6213 7244

**Email:** NMSF.Secretariat@ret.gov.au

### National Review into Model Occupational Health and Safety Laws

On 4 April 2008, the Minister for Employment and Workplace Relations, the Hon Julia Gillard MP, appointed an independent advisory panel to conduct a national review on the development of a model occupational health and safety act (OHS Act).

The review will focus on the content of principal OHS Acts as well as the overlap with other safety laws such as mining safety, electrical safety, rail safety, road transport safety, maritime safety and dangerous goods safety. Although the review will not cover the content of other safety laws, it will examine the extent to which such laws could be accommodated under a model OHS Act.

The closing date for written submissions was 11 July 2008. The review panel is expected to provide a report and recommendations to the Workplace Relations Ministers' Council on 31 October 2008 on matters relating to duties of care and the nature and structure of offences, and on 30 January 2009 on the remaining matters.

Any queries on this review should be directed to the National OHS Review Secretariat on 1300 131 798 or visit www.nationalohsreview.gov.au for the latest news.

# 2008 Surface Mine Emergency Response Competition

## Resources Safety's role in competition

Resources Safety staff have again been part of the success of the annual Surface Mine Emergency Response Competition, held at the Kalgoorlie Prospectors and Miners' Hall of Fame on 2-4 May 2008.

As usual, South West and Pilbara Regional Mining Engineer and emergency response competition stalwart Peter O'Loughlin played a major part as one of the chief adjudicators. This is a huge task involving the coordination of more than 100 competitors, 60 adjudicators, 20 assistants and a large number of volunteer 'casualties'.

Senior Occupational Health Inspector Gary Hussey adjudicated the team safety section of the confined space rescue over the two days, before driving back to his base in Collie.

Gary, who has been involved in these types of competitions for almost 20 years, said the confined space event this year included a complex scenario that brought together roping and breathing apparatus skills and inert gas knowledge.

'This was an extremely challenging event that tested all the skills needed for rescues under these conditions,' Gary said.

Also in attendance was Principal Media Officer Peter Lewis who reported on the event, while Tse Yin Chang from Publications and Promotions used her photographic skills for the photo spread in this issue of *MineSafe*.

The weekend was wrapped up at the presentation evening, which attracted more than 400 people. Kalgoorlie-based Regional Mining Engineer Jim Boucaut presented BHP Billiton's Leinster Nickel Operations with the Hazardous Chemicals event award, sponsored by Resources Safety.



*Left: Garry Hussey adjudicating the confined space rescue. Right: Chief adjudicators Peter O'Loughlin and Mark Pannewig discussing results*

All photos TYC

# 2008 Surface Mine Emergency Response Competition

## Competition winners

This year's Surface Mine Rescue Competition returned to the Prospectors and Miners' Hall of Fame in Kalgoorlie, following a break from tradition last year when the event was held in Coolgardie to celebrate the centenary of the famous Varischetti rescue.

Organised by the Chamber of Minerals and Energy Western Australia and run by the dedicated Eastern Regional Council Mine Rescue Committee, the competition is the largest of its type held in the southern hemisphere and attracted more than 2,500 spectators.

The event was won overall by AngloGold Ashanti's Sunrise Dam mine rescue team, ahead of the BHP Billiton Kalgoorlie Nickel Smelter and Concentrator team and Gold Fields Agnew team.

The open day on Sunday attracted thousands of visitors who watched teams compete in scenarios involving fire fighting, vehicle extrication, hazardous chemicals, rope rescue, confined space rescue, first aid and team skills and safety. This provided a great opportunity for members of the public to gain an insight into the mining industry in general, and the professionalism and skills of mine rescue teams in particular.

The competition, which promotes and enhances emergency response and rescue skills throughout the Western Australian mining industry, demonstrates the commitment of the industry to safety and health.

## Competition teams

**Agnew Gold Mine** – Gold Fields Australia
**Barrick Kanowna Mines Rescue** – Barrick Gold
**Barrick Lawlers** – Barrick Gold
**Kalgoorlie Nickel Smelter and Concentrator** – BHP Billiton Nickel West
**Leinster Nickel Operation** – BHP Billiton Nickel West
**Black Swan Nickel** – Norilsk Nickel
**South Kalgoorlie Operations** – Dioro Exploration
**KCGM Mines Rescue** – Kalgoorlie Consolidated Gold mines
**Frog's Leg Mine Rescue** – La Mancha Resources
**Lake Johnston Operations** – Norilsk Nickel
**Murrin Tripods** – Minara Resources
**Newman Joint Venture Mine Rescue Team**
**Southern Cross Operations** – St Barbara Ltd
**St Ives Gold Mine** – Gold Fields Australia
**Sunrise Dam Emergency Response Team** – AngloGold Ashanti

## Honour Board

| | |
|---|---|
| **Fire Fighting:** | Gold Fields Agnew |
| **First Aid:** | Gold Fields Agnew |
| **Vehicle Extrication:** | AngloGold Ashanti Sunrise Dam |
| **Hazardous Chemicals:** | BHP Billiton Leinster Nickel Operation |
| **Rope Rescue:** | AngloGold Ashanti Sunrise Dam |
| **Overall First Aid:** | Gold Fields Agnew |
| **Overall Breathing Apparatus Skills:** | Minara Resources Murrin Murrin |
| **Confined Space Rescue:** | BHP Billiton Kalgoorlie Nickel Smelter and Concentrator (KNSC) |
| **Team Skills:** | Gold Fields Agnew |
| **Team Safety:** | Minara Resources Murrin Murrin |
| **Theory:** | BHP Billiton KNSC |
| **Individual Theory:** | Alana Gallagher, BHP Billiton KNSC |
| **Emergency Response Coordinator's Challenge:** | Tim Campbell, La Mancha Resources Frog's Leg |
| **Best Captain:** | Michael Nugus, AngloGold Ashanti Sunrise Dam |
| **Best New Captain:** | Sian Nichols, Dioro South Kalgoorlie Operations |
| **Best New Team:** | BHP Billiton KNSC |
| **Best Scenario:** | Confined Space Rescue |

# First aid scenario based on fatality

The reason many of the competition scenarios look so real is that they are often based on actual incidents.

This year's First Aid event was based on a real situation that resulted in a fatality on a public road 11 km from a mine site. It involved a car rollover with five passengers on their way to work at the mine.

'It happens on a public road where the driver takes a corner, over corrects and then the back wheel hits a concealed rock, or toe, forcing it to flip three or four times, and a passenger not wearing a seatbelt is ejected,' event manager Michael Safy said, describing the scenario.

'The rescue teams are first on the scene, arriving to find the occupants performing CPR on an unconscious passenger. The Police and Ambulance have been notified but are 35 km away.

'Ten minutes into the scenario, we introduce a site clerk — the wife of the seriously injured — as a distraction, who then has an asthma attack.'

Michael said the aim of the exercise was to evaluate the level of knowledge, skills and efficiency of emergency response teams in responding to a first aid incident at a surface mine involving multiple casualties. The teams are required to secure the area and ensure ongoing safety for all involved, as well as treat and hand over patients to the ambulance crew.

The casualty injuries are numerous and varied. The driver, who happens to be a type 2 diabetic, is in severe shock with worsening hyperventilation, and a hypoglycaemic episode develops.

Another casualty has facial lacerations and a dislocated ankle, and others have injuries typical of a rollover.

The unconscious passenger, after prolonged attempts of resuscitation with CPR and defibrillation, shows no response or pulse and is finally announced deceased.

The exhausting scenario really puts the teams through their paces, and is excellent training for complex real life situations.

Volunteer Leah Brady, who realistically portrays the 'asthmatic' wife of the deceased, said she was happy to give up her time for a good cause.

Leah, who works at the LanFranchi mine, said people who worked in mines knew that rescue teams were there to look after them, so it was important that they had the appropriate training.

'The best place to learn is from these activities rather than the real thing, and since these people (rescuers) give their own time, it is good to be able to lend a helping hand. It is also a change for me as I work in administration,' she said.

'I love it, it's great and I for one am learning things myself, like opening air ways, so it's a good learning curve. I was actually exhausted by the end of the day, but we all work together, with everyone doing their bit, so it was awesome. I will definitely volunteer again.'

Paramedic Dan Navarro, from Kalgoorlie St John Ambulance, who assisted, said that there was a close association with miners, with many volunteering for the organisation.

'Many people from the mining industry volunteer with us and take the skills they learn back to the industry,' Dan said.


*Ambulance paramedic Dan Navarro*


*First Aid event volunteer Leah Brady*


*Leah in action*

# Twists and turns keep scenarios fresh


*At the fire fighting event, the twist was an 'accident' involving the gas supply to the scenario*

A number of interesting twists were part of this year's competition designed to keep competitors on their toes.

In the fire fighting scenario, an accident 'happens' as part of the event when a volunteer controlling the gas flow from a trailer suffers serious burns after it catches fire and explodes.

Chief adjudicator Mark Pannewig, who recently retired as committee chairman after two and a half years at the helm, said an accident within the scenario was planned as part of the scenario.

'The teams don't know what to expect and we are constantly coming up with new ideas to keep the competition fresh,' he said.

In the rope rescue scenario, an electrician is trapped in the air after a rope failure and is hanging on to an electrical cord while his colleague has fallen to the ground and been injured, with a heavy air conditioner laying on top of him.

Mark said ropes used for rescue purposes had to meet minimum Australian standards and be graded to three tonnes.

'We employ an eight-to-one safety ratio so, basically, the maximum load you would use on a three tonne rope is 375 kg. Also, any equipment "shock loaded" after the exercise is destroyed, and ropes are replaced regularly as the abrasive and acidic environment at mine sites can destroy them,' he said.

He said chemicals like sulphuric acid were capable of destroying a rope within ten seconds.

In the rope rescue scenario, the electrical cable is about to break any time, with the 'victim' having trouble 'hanging on for dear life'.

The now panicking 'victim' has to be calmed — 'Breathe deeply and save your energy', a rescuer says while explaining to him how the rescue will be conducted before he is hauled up to safety.

The rescue team then turns its attention to the injured man below.

'The first thing they have to do is stabilise the patient, and after any fall injury we always suspect spinal injuries, as is the case with car accidents. The teams need to look at the mechanisms of injury to develop clues on how the person sustained an injury, and also check for any immediate dangers, such as the potential for electric shock in this case,' Mark said.

'Part of the initial scene survey is to look for injuries and things specific to the scenario. In HazChem you have the dangers of chemicals and respiratory complications, with dangerous goods you have corrosive materials and explosives, and with fires the issues of burns and inhalation of smoke.'

One of the important tasks in hazardous chemicals (HazChem) events is to check the equipment beforehand to ensure nothing has been damaged in transit, especially the respiratory equipment.

'The last thing you want in a rescue is for things to go wrong and the safety of rescuers is very important,' Mark said.

This point is emphasised during the HazChem event where xanthate, used as a flotation aid in processing plants and an extremely corrosive chemical, has spilled, resulting in a 'casualty' suffering from chemicals burns and extreme pain.

'Firstly, it is important for the team to identify the chemical, or chemicals, involved and stabilise the chemical spill while protecting people and the rescue team,' Mark explained.

Special fully encapsulated HazChem suits, which provide the highest levels of protection, are used. Mark said it was important to match the suits to the chemicals involved, and different types offered different levels of protection. The team needs to identify the chemicals involved to determine which suits and protective equipment are required to undertake the rescue.

Most breathing apparatus equipment (BA) has a working duration of about 30 minutes and must be at least 80 per cent full prior to use, but it is used for much shorter periods in extreme temperatures and team members replace each other in these circumstances.

As the volunteer 'casualties' in scenarios like the HazChem event endure tough conditions, they are rotated about eight times over the weekend. Mark suggests that any potential volunteer to these events should do their homework prior to applying.

In the middle of the vehicle extrication event, the 'wife' of a 'casualty' who is fatally injured arrives at the scene in an

emotional state while paramedics are trying to revive her partner.

To make matters worse, the 'wife' suffers a serious asthma attack and requires first aid treatment herself. In the meantime, the now-unattended vehicle that she was driving, which still has the engine running, starts rolling towards the accident scene where other patients are being treated.

Another challenge this year was the team coordinators event, which was adapted so that coordinators could coordinate a rescue on 'their' site, and where they act as if the scenario was happening at their workplace as a 'real' event.

'This was a big learning curve for them and hasn't been done before,' event coordinator Rodney Goldsworthy said.

Coordinators had to communicate with their team captains to confirm all the information is correct at the scene, and activate their crisis management team at head office to deal with external stakeholders such as Resources Safety, the media, coroner and police.

'This is all about continual improvement,' Rodney said.


*Competitors in the team coordinators event found the scenario turned on them and they had to coordinate a rescue at their site. Here are some of the participants with Rodney Goldsworthy (back row, second from right)*

## Confined space response

One of the most important parts of the mine rescue exercises is the team debriefing following each scenario. This provides feedback to the participants, with both positive and negative points raised, as well as anything that may have been missed.

For the confined space rescue event, feedback was provided by a diverse range of emergency response professionals and Resources Safety adjudicator, Gary Hussey.

The aim of confined space rescue is to get people out safely and quickly, without the rescuers jeopardising themselves.

The first part of the confined space scenario involved a workplace inspection to be carried out prior to a shutdown, where the emergency response team was expected to be on standby over the duration.

The shutdown involved a solvent extraction separation column that had been cleaned and purged. In normal operation, the area was classified as a Class 1 and Division 1 hazardous location because of the expected presence of flammable vapours from organic solvents used in the extraction process.

The teams were required to perform a proactive preventative role by inspecting all work fronts for compliance to the safety management system of the specific site, and checking items such as permits and authorisations, hazard identification and control, safety behaviours and area requirements.

Equally important were the condition and suitability of personal protective equipment (PPE), barricading and signage, housekeeping and appropriate competencies.

Any non-compliance was required to be amended when identified, and reported and documented as per the site incident reporting procedures. Adjudicator Ben Ingham said the rationale was to involve rescue teams in the planning process with compliance-based work before any emergency.

'We are trying to educate competitors to use prevention rather than cure, and ensure emergency rescue teams have good compliance to Australian standards. Teams increase their level of response by practising drills and rescue plans,' Ben said.

In the scenario, the shutdown was to allow grinding and removal of scale and corrosion from fixings. The hazards presented were considerable and included:

- work front not being ready for the job;
- incomplete risk assessments;
- insufficient supply of nitrogen;
- heat stress;
- flammable atmosphere;
- sparks;
- no authority to start;
- slips and trips;
- fails;
- falling objects;
- exceeding working durations;
- incorrect escape equipment;
- low oxygen environments;
- lack of training and resources; and
- delayed rescue.

Each hazard required a hazard control measure and to be documented, with each job step, in the job safety analysis (JSA). The material safety data sheet (MSDS) for a hazardous substance provides extensive information on its safe handling, transport, storage and disposal, covering emergency responses such as first aid, fire fighting and accidental release control measures.

The dangers in this rescue were many — according to the MSDS of the industrial solvent, it is extremely dangerous and inhalation can cause fatal chemical pneumonitis, death, unconsciousness, dizziness, nausea, skin irritation and irritations to the respiratory track. While stable under normal conditions, those handling it must avoid heat, sparks, open flames and other ignition sources, and strong oxidising agents to prevent combustion, which releases a complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide and other organic compounds.

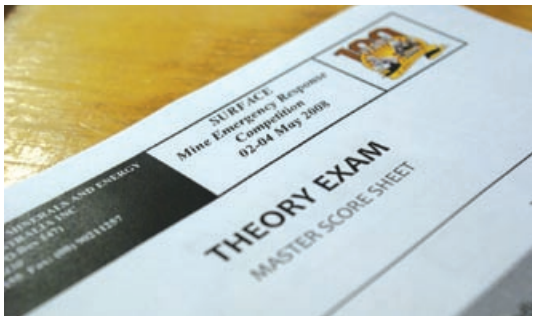
The teams had to absorb a lot of information in a short time to devise the best method for a safe and effective rescue.


*Adjudicators Tobias Byrne (left) and Ben Ingham of RECEO Solutions, sponsor of the confined space rescue event*

# 2008 Surface Mine Emergency Response Competition


WELCOME

THEORY




FIRE FIGHTING

# 2008 Surface Mine Emergency Response Competition

## CONFINED SPACE RESCUE

## FIRST AID

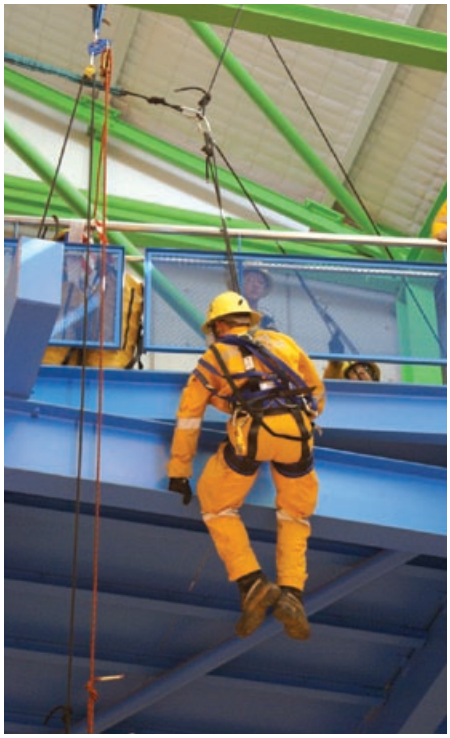
## VEHICLE EXTRICATION

All photos TYC

# 2008 Surface Mine Emergency Response Competition

TEAM SKILLS

HAZARDOUS CHEMICALS

ROPE RESCUE

# 2008 Surface Mine Emergency Response Competition

## ER COORDINATORS CHALLENGE


## PRESENTATION EVENING


All photos TYC

# Fatal fall **from forklift**

Earlier this year, a Geraldton lobster processing company pleaded guilty for failing to provide a safe working environment after an employee died as a result of a workplace fall in 2005.

The prosecution was brought by the WorkSafe Division of the Department of Consumer and Employment Protection. As noted by WorkSafe WA Commissioner Nina Lyhne following completion of court proceedings, the case demonstrated why riding on the tines of forklifts was prohibited, and was a tragic reminder of the importance of workplaces having safe systems of work in place at all times.

The incident is described below as the lessons learned apply wherever forklifts are used, including the resources sector.

In December 2005, a truck driver employed by the processing company was helping to load a truck with pallets of live lobsters for transport to Perth at the 'Lives Facility' at Geraldton Fisherman's Wharf.

A pallet trolley was used to move the pallets around on the back of the truck and, when the truck was almost full, the pallet trolley was stored on the back of the truck so it could be used to unload the truck when it reached its destination.

A forklift was used to move the pallets and pallet trolleys on and off the trucks, and it was common practice at the workplace for people to be lifted on pallets on the tines of forklifts to access the backs of trucks.

In this incident, the truck driver asked another employee to lift him to the back of the truck on the forklift tines so he could place the pallet trolley on the truck. The other employee suggested that a pallet be placed over the tines, but, since the usual type of pallet was not available, the truck driver did not wish to use one.

The truck driver stood on the forklift tines with the pallet trolley, and the other employee drove the forklift to the truck, lifted the tines until they were about 5 cm over the edge of the truck and lowered the tines onto the back of the truck.

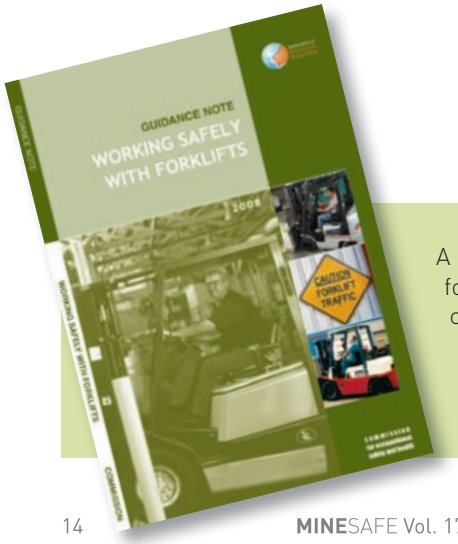
In the course of moving the pallet trolley, the truck driver fell from the tines of the forklift, striking his head on the bitumen. He died in hospital ten days later.

'The forklifts used by Geraldton Fisherman's Co-operative each had a sticker at eye level indicating that people were not to be lifted on the tines,' Ms Lyhne said following the court case.

'Despite this, it was common practice at this workplace for people to be lifted to the backs of trucks on pallets on forklift tines.

'It was up to the employer to provide appropriate training and supervision and have safe work practices in place to ensure that the instructions provided by the forklift manufacturer were followed and that warning stickers were heeded.

'Since this incident, the employer has made several changes to make the workplace safer — including prohibiting the lifting of people on forklift tines — but all too late for the unfortunate worker who lost his life.'




A guidance note on working safely with forklifts can be purchased for $3.30 per copy from WorkSafe (telephone 9327 8777) or downloaded at no cost from the publications section at www.docep.wa.gov.au/WorkSafe

## Code of practice prohibits 'live' electrical work

The Energy*Safety* media statement accompanying this article announces a new code of practice, issued by the Director of Energy Safety, that effectively prohibits all 'live' electrical work on mains voltage equipment, except in very rare circumstances. 'Live' work is justified only by a greater risk of danger to the lives of persons using or affected by an electrical installation shutdown, compared with the risks incurred by electricians performing the 'live' work.

'Live' work includes work on or close to exposed energised parts where deliberate, accidental or inadvertent contact with those parts is possible, either directly with parts of the body or indirectly through tools, long objects, drills, cutting blades or dropped conducting objects.

The prime objective of the code is to prevent avoidable electrical accidents by requiring equipment to be properly isolated prior to commencing work. Also apparent is an intention to dissuade owners, managers and persons in charge of workplaces from pressuring electrical personnel to perform 'live' work by imposing strict obligations on all parties involved. Notably, the carrying out of a short duration isolation to install effective insulating barriers or shrouding over exposed parts is acceptable.

The code addresses any unavoidable electrical testing, fault-finding and commissioning work on energised equipment, and provides for specific measures to be adopted in order to safeguard persons in these circumstances.

Undoubtedly, the measures outlined in the code represent a quantum step change in the advancement of electrical safety. The code applies equally to mining operations and responsible persons need to become familiar with it. For an introductory period and until prescribed by legislation, the code provides guidance only and is not yet mandatory. Comments and suggestions for improvement should be forwarded to Energy*Safety*'s Principal Engineer Don Saunders (telephone 08 9422 5296, email dsaunders@docep.wa.gov.au).

# Electricians prohibited from generally working 'live'

The following announcement is extracted from a media statement released on 18 April 2008 by the Energy Safety Division of the Department of Consumer and Employment Protection.

Electrical contractors and electricians will effectively be banned from working on equipment operating at normal mains voltage under a new code of practice issued by Energy*Safety*.

'The code applies to electrical contractors and all electricians working in general industry. It also places obligations on contractors' clients and all employers of electricians who request that live work be performed,' Executive Director of Energy*Safety* Albert Koenig said today.

'Working on live electrical circuits and equipment or in very close proximity to live parts is potentially dangerous and mostly places the lives of electricians at risk needlessly,' Mr Koenig said.

Loss of production, increased costs and operational inconvenience will not be regarded as justifying live work.

Under the code, live work will be justified only if there is a greater risk of danger to lives of people using, or affected by, an electrical installation, compared with risks incurred by electrical workers asked to perform live work.

In such circumstances, a live work justification case, backed by a formal risk assessment under the code, must be made out by the licensed electrical contractor's client, requesting that live work be carried out. In respect of residential type installations, the code never allows live work.

If the electrical employer is satisfied that live work is justified and it can be carried out safely, a strict safety plan must be followed:

- the contractor must prepare a detailed work plan and set of procedures, complying with the code, to cover the work;
- all electrical workers involved in performing the work must agree it can be done safely;
- a competent and independent safety assessor must approve plans and procedures if the prospective fault current exceeds 10,000 amperes at the site in question; and
- an experienced safety observer must be present at all times while the live work is under way and must have no other duties while carrying out the observer role.

Mr Koenig said the code provided for routine activities, which generally need to be conducted while circuits are live, including testing, commissioning and location of faults.

'With this code, we are addressing a large number and variety of situations where electrical contractors and electricians are placed under commercial pressure by their clients to perform risky live work, merely to hold costs down, keep production going and avoid inconvenience,' he said.

He also noted that the code does not apply to the electricity transmission and distribution related activities within the electricity supply industry, as this sector has its own guidelines for safe work practices.

The publication *Code of Practice: Safe Low Voltage Work Practices by Electricians* may be downloaded from the Energy*Safety* website at www.docep.wa.gov.au/EnergySafety

# NSW electrical safety alerts

Earlier this year, the Mine Safety Operations Branch of the New South Wales Department of Primary Industries (NSW DPI) issued two electrical safety alerts involving high-voltage equipment in mining operations. The safety alerts (available at www.dpi.nsw.gov.au/minerals/safety/safety-alerts) are very good resources and the recommendations can be used as a reminder for electrical personnel on Western Australian mines.

### Electric shock from a high-voltage test set

In the first incident, described in *Mine Safety Report No. SA08-01*, an electrical worker received an electric shock while carrying out insulation testing of an 11 kV cable network. The electrical worker reached for the voltage control knob to make a fine adjustment of the output voltage of a high-voltage battery-powered test set when an electrical discharge occurred from the test unit to the worker. The test voltage at the time was 10 kV direct current.

The injured person was transported to hospital for medical testing and was given a 12 lead ECG test and four hours of observation, before being discharged and resuming normal duties.

The area was made safe by erecting a barrier pending an investigation.

The NSW DPI's findings were:

- the test set manual was not specific to the test set supplied and contained

Continued on page 16...

...from page 15

information that was intended for a different model of test set;

- the test set was placed into use without the benefit of product training from the supplier;
- marking and colour of leads was different to convention used on other types of test set; and
- the test set had reached a stable voltage and the cables under test were charged with stored energy that discharged through the victim to earth — the stored energy was capable of inflicting a lethal electric shock.

The NSW DPI made a series of recommendations, including those below.

- Mines should conduct a risk assessment to identify hazards associated with the use of high-voltage test sets. The control measures should be determined in consultation with test set suppliers and competent persons.
- Manufacturer's information relating to the safe use of any high-voltage test set should be supplemented by activity-based safe work practices and procedures developed on site in consultation with the test set users and supplier. Particular attention should be placed on basics, for example:

– electrical workers should be trained and authorised to use each type of high-voltage test set at the mine;

– connection diagrams should form part of training and user documentation;

– leads and earth terminals should be clearly identified;

– earth connections to the test set should be applied first and removed last; and

– security provisions should be applied for the storage and transport of each test set to prevent unauthorised access.

- *All* mines that reticulate high-voltage electricity should develop, implement and review specific procedures for the use of electrical test instruments on high-voltage equipment.

### Electric shock direct contact with high-voltage electricity

In the second incident, described in *Mine Safety Report No. SA08-02*, a person who was both a plant operator and electrician received a serious electric shock and burns when direct contact was made with a live 3.3 kV terminal in a switch-fuse unit that was fed from a 5 ampere earth fault limited system.

The operator had been given the task of isolating a surface conveyor belt to allow an electrical contractor internal access to the 3.3 kV slip ring conveyor motor for fault diagnostics. The isolation was carried out at a 3.3 kV MCC (UTL 3.3/3).

The safety alert recommends that the following actions be completed before high-voltage work is undertaken.

- Where mechanical interlocking is used to prevent access to live parts, the interlocking system must be correct for the application. These interlocks are to be verified and validated during routine maintenance.
- A properly conducted formal risk assessment must be carried out to examine any possibility of people coming into contact with an energised conductor.
- Detailed planning of high-voltage work must be carried out by qualified competent people.
- A detailed documented high-voltage work plan must be prepared with provisions for verification at each step.
- Every step must be clearly and effectively communicated to all persons involved in the supervision and work.
- All high-voltage work must only be carried out under a high-voltage permit system.
- All electricians involved in high-voltage switching and isolation must be trained and retrained periodically.
- Mines are to enforce their 'test for dead' policy.
- All underground mining operations that use high voltage should review their work practice to *HB 242-2007 High voltage mining equipment for use underground* (published by Standards Australia).

The safety alert also referred to *Mine Safety Report No. SA05-11*, which describes an incident where a contract electrician received a serious electric shock and burns when live 11 kV bushings in the rear of a bus tie circuit breaker cubicle were contacted.

## Coming soon from Energy*Safety* - new electrical log book

**All electrical work on mine sites must be entered into an electrical log book.**

- All electrical installing work
- Details of any electric shocks or burns to a person
- Details of fires caused by electricity and any dangerous occurrences involving electricity
- Results of statutory electrical testing of equipment

For log book enquiries, contact Energy*Safety*: **Phone** 08 9422 5200 **Email** energysafety@docep.wa.gov.au

# 2008 Dangerous Goods Safety ROADSHOW

SERIES 2

## DATES & VENUES

| | | |
|---|---|---|
| **KALGOORLIE** | **Tuesday, 2 September** | WASM Graduates' Hall, 50 Macdonald St |
| **ALBANY** | **Tuesday, 9 September** | Dog Rock Motel & Convention Centre, 303 Middleton Rd |
| **BUNBURY** | **Wednesday, 10 September** | Lighthouse Beach Resort, Ocean Drive |
| **GERALDTON** | **Tuesday, 16 September** | Ocean Centre Hotel, Corner Foreshore Drv and Cathedral Ave |
| **PERTH** | **Friday, 19 September** | Technology Park Function Centre, 2 Brodie Hall Drv, Bentley |

There will be three 15-20 minutes presentations at half-hourly intervals. The talks start at 8.30 am and will be repeated from 10 am. The following Resources Safety staff will be presenting and will also be available to answer individual queries:

- **Philip Hine**, *Director Dangerous Goods Safety Branch*
- **Lawry Lim**, *Principal Dangerous Goods Officer*
- **Henry Zuidersma**, *Principal Explosives Officer*

A Resources Safety Client Services representative will be on hand throughout the morning to provide information on the new dangerous goods licensing system and answer specific queries about the application process.


## TALKS

*Note: The Geraldton program will start 30 minutes later.*

### 8.30 am & 10.00 am

**Overview of legislation** – Philip Hine's presentation focuses on the key aspects of the new Dangerous Goods Safety Act 2004 and a brief introduction to the regulations.

### 9.00 am & 10.30 am

**Storage, handling and transport of dangerous goods** – Lawry Lim's presentation covers the application of risk management principles to the storage and handling of dangerous goods, the introduction of new major hazard facility (MHF) regulations, and key changes in the new Australian Dangerous Goods Code, 7th Edition (ADG7) for dangerous goods transport.

### 9.30 am & 11.00 am

**Explosives and security risk substances (SRS)** – Henry Zuidersma's presentation discusses new security arrangements under the Explosives and SRS Regulations. The management of explosives at mine sites is also covered.

**Want to know more?** There is no need to book. Just turn up between 8 am and 12 pm (or 8.30 am and 12.30 pm for Geraldton). Make the most of this opportunity to speak with a senior Dangerous Goods Officer or licensing representative. Further information is available from **www.**docep.wa.gov.au/events, **Telephone:** 08 9358 8002 or **Email:** ResourcesSafety@docep.wa.gov.au

# Dangerous Goods Safety Roadshow rolls on

The *Dangerous Goods Safety Act 2004* and associated regulations were proclaimed on 1 March 2008. Significantly, a new risk management approach for the safety and security of dangerous goods has been introduced, including new security requirements explosives and ammonium nitrate. Transitional arrangements will help industry phase in these new requirements.

Resources Safety is presenting the 2008 Dangerous Goods Safety Roadshow to help employers and employees understand the new legislation and how it may impact on them. The Dangerous Goods Safety legislation is overviewed, with an emphasis on the Explosives and Security Risk Substances regulations. General information is also provided on dangerous goods storage, handling and transport.

## Series 1

In May and June 2008, Resources Safety took the Dangerous Goods Safety Roadshow to Kalgoorlie, Karratha, Newman and Perth. The aim was to assist employers and employees, particularly in the mining industry, in understanding the new legislation and how it may impact on them.

About 300 people attended, representing a range of industry perspectives, mostly mining but also transport, medical and consultants.

## Series 2

Series 2 will follow the same format as Series 1.

***Dates and venues***

**Tuesday, 2 September, KALGOORLIE**
WASM Graduates' Hall
50 Macdonald Street

**Tuesday, 9 September, ALBANY**
Dog Rock Motel & Convention Centre
303 Middleton Road

**Wednesday, 10 September, BUNBURY**
Lighthouse Beach Resort
Ocean Drive

**Tuesday, 16 September, GERALDTON**
Ocean Centre Hotel, corner Foreshore Drive and Cathedral Avenue

**Friday, 19 September, PERTH**
Technology Park Function Centre
2 Brodie Hall Drive, Bentley

***Program and presenters***

There will be short talks about the Act and regulations, including explosives, storage and handling, and the dangerous goods security card, and an opportunity to speak with senior Dangerous Goods Officers and licensing representatives.

There will be three 15-20 minutes presentations at half-hourly intervals. The talks start at 8.30 am and will be repeated from 10 am.

The following Resources Safety staff are presenting and will also be available to answer individual queries:

- Philip Hine
  *Director Dangerous Goods Safety Branch*
- Lawry Lim
  *Principal Dangerous Goods Officer*
- Henry Zuidersma
  *Principal Explosives Officer*

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## Want to know more?

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Further information is available from:
www.docep.wa.gov.au/events
**Phone** 08 9358 8002
**Email** ResourcesSafety@docep.wa.gov.au


KARRATHA


TYC


AB

## KALGOORLIE

AB

## PERTH


TYC


TYC

## NEWMAN

TYC

# Drug abuse costing Australians

A new national report on *The Costs of Tobacco, Alcohol and Illicit Drug Abuse to Australian Society in 2004–05* is the first comprehensive report of its type since the 1998–1999 figures were released. Authored by Professors David Collins and Helen Lapsley, it is publication number 66 in the National Drug Strategy Monograph Series, and is available from the publications section of the National Drug Strategy website at www.nationaldrugstrategy.gov.au

The Federal Government commissioned the research, which revealed that the social costs of tobacco, alcohol and illicit drug abuse to Australian society had risen to more than $56 billion in 2004–05.

Lost workplace productivity due to tobacco was estimated at $5.7 billion, while alcohol accounted for a staggering $3.5 billion.

As a result, the Federal Government has established a National Preventative Health Taskforce to develop a strategy to bring a preventative focus to the health system. The Government's initiatives are outlined in a 9 April 2008 media release from the Minister for Health and Aging, the Hon Nicola Roxon MP. The three priority areas for the taskforce are obesity, tobacco and excessive consumption of alcohol.

The recently released guidance note on *Alcohol and Other Drugs at the Workplace*, issued by the Commission for Occupational Safety and Health (COSH) and Mining Industry Advisory Committee (MIAC) should assist employers to address concerns raised in the national report.

## Guidance note

At a local level, the guidance note is a useful starting point to address relevant issues where alcohol or other drugs may have occupational safety and health considerations at the workplace.

Strategies recommended by the guidance note include developing an alcohol and other drugs policy and supporting procedures for all levels of staff — and communicating these — as well as providing information and education on the risks of such use.

Having an alcohol and other drugs policy in place that sets out clearly how to address safety and health risks arising from people impaired by alcohol and drugs can help reduce the risk to all people involved.

Employers should bear in mind that if there are currently potential safety and health risks at the workplace from alcohol and/or other drug usage, the employer is required to prevent them arising, as far as practicable, under their general 'duty of care' to provide a safe working environment. Regulation 4.7 of the Mines Safety and Inspection Regulations 1995 specifically prohibits a person, whether or not an employee, being in or on a mine while adversely affected by intoxicating liquor or drugs.

Workplace policies and procedures, developed in consultation with workers and safety and health representatives, avoid confusion and uncertainty. The benefits of an alcohol and other drugs policy and supporting procedures include:

- meeting the general 'duty of care' obligations;
- preventing uncertainty when situations arise;
- demonstrating management commitment to a safe workplace and informing employees and others on acceptable behaviour; and
- facilitating peer support.

In terms of risk management, hazards associated with alcohol and other drug use at the workplace should be assessed in the same way as for other occupational safety and health issues. As such, workplace strategies should identify the cultural and workplace factors that may contribute to risks from alcohol and drug use.


There should be safeguards on tasks that require high levels of concentration or motor skills where a high risk, if workers are impaired by alcohol or drugs, has been identified.

Depending on the situation, providing ready access to counselling or support groups early in the development of such problems is recommended, as well as providing recreational options, especially when boredom may be a risk factor or workers are isolated from family and friends.

The workplace is an ideal place to run effective alcohol and other drug prevention programs because the peer support network at a workplace can be used to shape behaviour. Workers also have a better chance of recovery from alcohol problems if they can continue working.

The guidance note also provides details of organisations that can assist in rehabilitation and employee assistance programs, and more specific information on alcohol and other drugs.

The *Guidance Note: Alcohol and Other Drugs at the Workplace* is available from the mining publications section of the Resources Safety website at www.docep.wa.gov.au/ResourceSsafety

Hardcopies of the publication are available from WorkSafe at $3.30 a copy. The order form is available in the publications section of the WorkSafe website at www.docep.wa.gov.au/WorkSafe or contact the WorkSafe Publications Officer:

**Phone** 08 9327 8721
**Fax** 08 8321 6658
**Email** safety@docep.wa.gov.au

# What's new in publications

## Risk factors in the workplace

The risks that exist or may arise from alcohol and other drugs must be assessed individually at every workplace. Some risk factors to consider are listed below.

**Usage of alcohol and/or other drugs in relevant social groups**

If this increases, decreases or is a known problem, it may have an impact at the workplace.

**Patterns of alcohol and/or other drug consumption**

Different patterns of use create different risks. People who use large amounts on single occasions may create different risks compared to people who are regular heavy users.

**Type of workplace culture**

There may be a culture at work that encourages or accepts excessive consumption of alcohol and/or other drugs at the workplace.

**Availability of alcohol and/or other drugs**

At some workplaces, workers are more likely to be exposed to usage and therefore the risk of them being impaired may increase. In other workplaces, they may be more exposed to the consequences (e.g. workers in the hospitality industry may be more at risk of harm from non-workers impaired by alcohol).

**Isolation from family and friends**

Workers in isolated areas or separated from family and friends sometimes report that they are more likely to consume alcohol and/or other drugs due to boredom, loneliness or lack of social activities.

**Inadequate job design and training**

Unrealistic performance targets and deadlines, excessive responsibility, monotonous work or low job satisfaction may, in some instances, be risk factors. Symptoms of stress are sometimes associated with poor health, including alcohol and/or other drug related problems. Inadequate training, supervision and communication may also contribute to this risk factor;

**Inadequate supervision**

Jobs where there is inadequate supervision and performance management may increase the risk of alcohol and/or other drug related problems. Inadequate supervision and communication about expected roles and behaviour on the job and consequences of unacceptable behaviour may be a risk factor.

**Extended working hours or shift work**

Illicit drugs, such as amphetamines, or prescription medication, may be taken by workers to keep awake if they are working long hours or engaged in shift work.

**Interpersonal factors**

Bullying at work may increase risks. For guidance, see *Prevention and Management of Violence, Aggression and Bullying at Work – Code of Practice* published by Resources Safety.

**Poor working conditions**

Hot or dangerous environments may contribute to alcohol and/or other drug taking.

## Comment sought on draft safeguarding code

The Commission for Occupational Safety and Health (COSH) and its Mining Industry Advisory Committee (MIAC) are seeking public comment from interested parties on a draft *Code of Practice: Safeguarding of Machinery and Plant*.

Guardiing is not a new safety requirement, and remains the simplest and most effective method to prevent injury from machinery or plant arising from:

- the machinery and plant itself, such as shearing, cutting, impact, entanglement and crushing hazards;
- the location of the machinery or plant, such as stability (e.g. could it roll or fall over?) or its proximity to another structure; and
- systems or work associated with the machinery or plant, such as hazardous manual task injuries caused when operating or putting material into them.

The draft code has been developed under a tripartite approach, involving representatives of unions, employer organisations and government. It recommends ways in which safety and health hazards and risks commonly associated with inadequate guarding of machinery and plant can be addressed in accordance with the *Occupational Safety and Health Act 1984* and *Mines Safety and Inspection Act 1994*.

The draft code is available from the Resources Safety website at www.docep.wa.gov.au/ResourcesSafety

Please forward any comment by 10 October 2008 to the Executive Officer, Commission for Occupational Safety and Health:

**In person** 5th Floor, 1260 Hay St, West Perth
**Post** PO Box 294, West Perth WA 6872
**Email** worksafersvp@docep.wa.gov.au
**Fax** 08 9321 2148

# WorkSafe launches safe design code

A new code of practice on the safe design of buildings and other structures – the first of its kind in Australia – was launched by WorkSafe on 12 June 2008.

Issued under the provisions of the *Occupational Safety and Health Act 1984*, the code will assist people involved in designing buildings or other structures to meet the requirements of Western Australia's workplace safety and health laws. It is aimed at designers, architects, builders and engineers, all of whom have responsibility for safe building design.

The *Code of Practice: Safe Design of Buildings and Structures* was launched by Tony Cooke, Chair of the Commission for Occupational Safety and Health, who was joined by Dr John Culvenor, a specialist in industrial ergonomics, human factors, engineering and occupational safety and health.

Dr Culvenor said that safe design applied to every activity and every industry, and risks should be controlled at the design stage wherever possible.

'This includes considering how design can affect workers during construction and how it can later affect maintenance workers,' Dr Culvenor said. 'The potential hazards to the eventual users of the structure are best addressed via upstream thinking.'

The code of practice:

- explains the legal obligations applicable to a person who is in control of, or who may have influence over, the design of a building or other structure; and
- gives guidance on how these obligations can be met by providing practical advice on ways of maximising the safety of the design.


Mr Cooke said it was a pleasure to launch the code, the development of which has involved extensive consultation with industry at both State and national level.

'The code aims to address the lost time injury rate in the construction industry, which is around 15 injuries per million hours worked,' Mr Cooke said.

'This can be achieved by ensuring that safety and health issues related to building and structure design are thoroughly examined before construction begins, including the new requirement that designers provide written safety and health reports to clients prior to construction.'

The code contains information to help designers with these reports, which must include:

- an assessment of potential injury or harm;
- the action the designer has undertaken to reduce those risks such as changes to design or construction methods or materials;
- parts of the design where identified hazards have not been resolved; and
- a level of detail appropriate for the client and the hazards and risks.

'It's all about reducing the risks through considering human factors and organisational issues, and not just products,' Mr Cooke said.

'There is also a need to consider how the design of related products or systems affects building design.

'Controlling risks as early as possible in the design and planning stage not only improves safety, but also saves money by avoiding any need to make changes at a later date. The key is to get it right in the design phase.'

The code of practice can be downloaded, at no cost, from the WorkSafe website at www.docep.wa.gov.au/WorkSafe

Hardcopies are available at $3.30 a copy. The order form is available in the publications section of the WorkSafe website or contact the WorkSafe Publications Officer:

**Phone** 08 9327 8721
**Fax** 08 8321 6658
**Email** safety@docep.wa.gov.au

## Changing behaviour to prevent accidents

A study that looks at changing human behaviour to help prevent accidents in the state's mining industries is underway in Queensland.

Announced on the Queensland Department of Mines and Energy website in March this year, the 12-month study, between the Queensland Mines Inspectorate and Clemson University in South Carolina, is investigating ways to help prevent fatal accidents. It is supervised by Dr Scott Shappell, Professor of Industrial Engineering at Clemson University and a speaker at last year's Chamber of Minerals and Energy WA Safety Conference.

Dr Schappell is a world expert in human behaviour factors, systems safety, error management and accident investigation. His research interests include human error, human factors safety management systems, fatigue effects on performance, and crew resource management. He is the co-developer of the Human Factors Analysis and Classification System (HFACS) and Human Factors Intervention Matrix (HFIX) that are used worldwide in a variety of high-risk industries, such as aviation, mining and medicine, for accident and incident investigation and the development of interventions.

On-ground research in Queensland mines is being carried out by Jessica Patterson, one of Dr Shappell's PhD students. The objective is to study accidents involving workers coming into contact with machinery or vehicles, and develop interventions that can be applied to help prevent such accidents.

Ms Patterson is visiting mines sites across Queensland and working with the Safety in Mines Testing and Research Station (SIMTARS) and regional departmental offices in the state.

# Digging deeper

The recent 'Digging Deeper' report highlighted the need for more successful consultation between management and workers in New South Wales.

The *Digging Deeper Action Plan* is the NSW Mine Safety Advisory Council's response to the 25 recommendations of the Digging Deeper Wran Consultancy Project. The action plan prioritises the activities of industry stakeholders to work toward achieving world class occupational health and safety (OHS) in the state.

The NSW government asked the Mine Safety Advisory Council to oversee industry's implementation of the action plan through educative assistance programs.

Detailed information on the Digging Deeper Action Plan is available from the NSW Department of Primary Industry website at www.dpi.nsw.gov.au/minerals/safety/consultation/digging-deeper

According to the website, viewed in July 2008, up to 30% of mine sites in NSW are pro-actively working towards best practice in OHS. A further 43% of sites are currently in a transitional stage and about 27% are currently reactive to OHS issues. By working closely with industry, the Mine Safety Advisory Council will address areas that need improvement, specifically:

- fatigue and hours worked;
- contractor safety; and
- effective working relationships.

The action plan's educative assistance programs will guide organisations to become proactive on health and safety, and help those who are already proactive to achieve best practice. The Mine Safety Advisory Council will also oversee the follow-up of organisations where serious deficiencies are found.

As part of the Digging Deeper communication plan, the Mine Safety Advisory Council has developed a poster to communicate the message that employees should feel empowered to raise health and safety issues with their supervisors and managers.

Norman Jennings, Council Chairman, says that employees should know that they can discuss these issues in a meaningful way. Mr Jennings points out that Digging Deeper Platinum Rule 2 says that employers should 'listen and talk with their people'.

So how does all this relate to safety culture in Western Australia?

At the 2007 Mines Safety Roadshow, one of the frequently asked questions after the safety culture presentations was 'Where do we start?' It was noted that an important component of any successful safety culture is effective consultation, communication and collaboration between management and workers. One aspect of this is how technical personnel and senior management engage all workers in creating a more positive safety culture. In other words, how do we foster effective working relationships?

John Flint, Executive Officer for the NSW Mine Safety Advisory Council, recently told Lindy Nield, acting Occupational Health Manager for Resources Safety, that good management, and more specifically good management of OHS, requires 'effective personal relationships' between managers and workers.

Mr Flint referred to a book entitled *Safety at the Sharp End: A Guide to Non-technical Skills* by Rhona Flin, Paul O'Connor and Margaret Chrichton. He suggested that the so-called non-technical skills for those in leadership positions are very important in tackling 'cultural' issues — managers need more than technical skills to motivate cultural changes.

It is also worth investigating the findings of the Digging Deeper Wran Consultancy Project, and the action plan developed in response, to see how companies might apply these in the Western Australian context. The 'Ten Platinum Rules' are a good starting point.


## Ten Platinum Rules

**Digging Deeper identifies an underlying theme across industry — the need to get the basics of OHS management right.**

**The Platinum Rules codify the fundamental steps industry should take to more effectively manage OHS.**

1. **Remember you are working with people**
2. **Listen to and talk with your people**
3. **Fix things promptly**
4. **Make sure your paperwork is worth having**
5. **Improve competence in OHS**
6. **Encourage people to give you bad news**
7. **Fix your workplace first**
8. **Measure and monitor risks that people are exposed to**
9. **Keep checking that what you are doing is working effectively**
10. **Apply adequate resources in time and money**

**From www.dpi.nsw.gov.au/minerals/safety/consultation/digging-deeper**

# The Giant Walk
## — 2008 world record challenge

In 2006, workplaces, schools, associations and individuals helped Western Australia walk into the record books in *WA's Giant Walk – The Guiness World Record Challenge*. The record was claimed with an impressive 100,915 people walking 1 km simultaneously at over 500 locations throughout Western Australia.

The previous record owners, Canada, then regained the record in October 2007 with 231,635 walkers participating throughout the country.

The Premier's Physical Activity Taskforce is keeping the challenge alive, with *The Giant Walk 2008* scheduled for Monday 1 September.

Like the previous event, The Giant Walk 2008 will be held at 12 noon (Western Standard Time), but this time at a number of venues across Australia.

Going national will address the population disparity somewhat. Canada's population is about 33 million, according to the US Central Intelligence Agency's *The World Fact Book* (in the library publications section at www.cia.gov) whereas, according to the Australian Bureau of Statistics (www.abs.gov.au/ausstats), Australia's is about 21 million – and Western Australia's is only about 2 million.

The Giant Walk website at thegiantwalk.com.au contains all the information you need on:

- how to organise and promote your own walk event; or
- how to find a walking venue near you.

Get on board and register now on the website for your chance to be part of Australia's record-breaking walk!

All walk coordinators need to register their walk event before Friday 29 August 2008.

If you are thinking about organising an event, but you are not ready to register, the Premier's Physical Activity Taskforce would still like you to contact them so they can keep track of what events are in the planning stages across Western Australia.

### *Contact details*

The Giant Walk
The Premier's Physical Activity Taskforce
PO Box 1239
Subiaco WA 6904

**Phone** 08 9492 9630
**Fax** 08 9213 7182
**Email** giantwalk@dsr.wa.gov.au

### *MineSafe invitation*

Resources Safety invites *MineSafe* readers who participate in The Giant Walk 2008 to send photographs and brief descriptions of their event to appear in the next issue of *MineSafe*.


*Resources Safety joined forces with Main Roads WA to walk around Queens Garden in East Perth for the WA's Giant Walk in 2006. There were 53 walkers.*

## Tools for healthy active workplaces

To assist Western Australian workplaces wanting to improve the health and wellbeing of their employees, the Department of Sport and Recreation in partnership with the Premier's Physical Activity Taskforce has commenced the Healthy Active Workplace initiative.

One of the aims is to provide access to a range of quality resources and education, training and online services to assist with the implementation of workplace health programs. To help achieve this, the Department of Sport and Recreation publishes the *Healthy Active Workplaces* eNewsletter, which contains information on forthcoming events and useful resources, and ideas to keep active. To subscribe, go to the Department's website at www.dsr.wa.gov.au and access the Healthy Active Workplaces webpage via the quick links feature.

A *Healthy Active Workplaces Tool Kit* features in the 'What's on the web' section of the winter edition of the eNewsletter. Developing a workplace health and wellbeing program does not have to be complicated. The web-based tool kit breaks the process into three simple phases to help guide you. It is a simple step-by-step guide to create, activate and evaluate your workplace health and wellbeing program. It includes sample instruments, programs and evaluation tools. As for all successful projects, the tool kit advises that the more time you can spend in the planning, thinking and consulting stages of each step, the better your outcomes will be.

Another item in this section is *WA Show Case*. A number of Western Australian workplaces have implemented a health and wellbeing program. Of these, some are leading the way by providing comprehensive workplace health programs that

look at holistic health and integrate organisational practices into their program. The experiences, strategies, steps and lessons learnt of four organisations are summarised in case studies.

***Contact details***

Healthy Active Workplaces
eNewsletter
Department of Sport and Recreation
PO Box 329
Leederville WA 6903

**Phone** 08 9492 9776 (Claire Cloney)
08 9492 9776 (Tahlia Maslin)

**Fax** 08 9213 7182

**Email** info@dsr.wa.gov.au

**Health Active Workplaces Tool Kit**

***Create***

- Gain management support
- Determine the budget
- Develop goals and objectives
- Establish a project team of employees with a range of experience and knowledge
- Find out what employees would like in a program

***Activate***

- Access existing resources and expertise of service providers
- Tailor the program and activities to employee needs
- Maximise flexibility to allow participation in the program
- Link with external activities and events

***Evaluate***

- Seek feedback from employees
- Re-visit goals and objectives
- Measure health behaviour changes
- Identify improvements to the organisation as a result of the program

From www.dsr.wa.gov.au

# Guide to healthy living

'Eat, drink and be healthy' was the appropriate title of a presentation at the CME Safety and Health Conference held in Perth earlier this year. Resources Safety's Peter W Lewis attended and looks at the implications for mining workers.

Presented by Dr Tim Crowe, senior lecturer from the School of Exercise and Nutrition Sciences at Deakin University, the final session provided a lively and entertaining insight into a range of research data on Australian health habits and implications for mining workers.

Dr Crowe provided a bigger picture about the health of Australians and the main factors affecting our disease risk, and what people can do about it, particularly in terms of diet and lifestyle activity.

In a snapshot of Australian health, 29.6% of people die from cancer, followed by 17.8% from heart disease, 4.7% from respiratory disease and 3.3% from diabetes (although most of these die from heart disease).

One of the biggest concerns Australians have is the expanding waistline, with more than a third being overweight.

'The danger is fat in the middle (stomach), which is not only insulin resistant but increases the risk of thrombosis and inflammation in the body. It's not how fat you are, but where the fat is, and men with waistlines greater than 94cm and 80cm for women are at risk,' Crowe says.

This can lead to cardiovascular disease, which is made worse by age, being male (females have an advantage before menopause), family history, smoking, high blood pressure, inactivity, diabetes and a diet with high saturated fat, low fibre, and low intake of fruit, vegetables and fish.

One of the best foods to eat is oily fish such as salmon, herring and sardines, which are high in the omega-3 fatty acids. This offers protection from heart disease (stops blood from clotting), arthritis (anti-inflammatory), depression, Alzheimer's disease and high blood pressure.

Crowe says the majority of cancer risk is from what you eat, whether or not you drink and smoke, and if you are overweight. The chances of developing cancer are increased more than 60 per cent with bad food and lifestyle habits.

The second most common cancer that people die from is colon cancer, and only 10-15 per cent of cases are genetically linked. Surprisingly, 75 per cent of colon cancer occurs in people with average risk, which increases for people over 50, and those with poor diet and lifestyle. He recommends exercise, a high fibre (30 g per day) and low fat diet, and the use of calcium and folate.

Another concern addressed by Crowe is the effects of shift work on health, which increases the risk of obesity, heart disease, high blood pressure, poor eating habits, mood changes, sleep deprivation and stomach upsets.

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# Healthy active workplaces

...from page 25

What can shift workers do? For a start, there still is the need to maintain three meals per day, with the main meal having a good portion of protein to assist with alertness.

Other actions include avoiding heavy meals after midnight, using coffee in the first half of the shift only, sticking with 'lighter' food high in carbohydrate before bed and eating 'breakfast' soon after rising.

Crowe recommends snacks such as canned gourmet tuna, trail mix, boiled eggs, soups for one, 'snack right' biscuits, yoghurt, and pita bread and dips.

'In order to stay active with a shift work regime, you should have a "wake up" routine that has some physical activity as part of it. It also helps if you can incorporate short bursts of activity during a shift and perhaps even join a weekly sports team with other shift workers,' Crowe said.

## Dr Crowe's Nutrition and Lifestyle Guidelines for Cancer Prevention

- Choose a diet rich in a variety of plant-based foods
- Eat plenty of vegetables and fruits
- Maintain a healthy weight
- Prepare (avoid charring) and store foods safely
- Do not smoke
- Drink alcohol only in moderation, if at all
- Eat foods that are low in fat and salt
- Avoid high-dose vitamin and mineral supplements
- Take part in regular physical activity
- Be safe in the sun

## Go for 2 and 5

Fruit'n'Veg Month is scheduled for September in 2008.

Fruit 'n' Veg Month aims to increase awareness of the need to eat more fruit and vegetables. The month provides a focus for different organisations to promote fruits and vegetables using a variety of activities.

Western Australian schools have been conducting Fruit'n'Veg Weeks since 1990.

Some workplaces also participate in Fruit'n'Veg Month promotions.

Schools Fruit 'n' Veg Week will be held 8-12 September 2008. More details are available at www.fruitnvegweek.health.wa.gov.au

Information about the *Go for 2 fruit and 5 vegetables* health initiative is available at www.gofor2and5.com.au

# Occupational health news

# Safety shower and eye wash standard

Safety showers and eye washes featured in the May 2008 issue of *MineSafe* (vol. 17, no. 1). Further to the information contained in that article, there is another Australian Standard that also applies — AS 4775:2007 *Emergency eyewash and shower equipment*.

This standard specifies minimum performance and use requirements for eye wash and shower equipment for the emergency treatment of the eyes or body of a person who has been exposed to materials which may cause injuries. It covers the following types of equipment:

- emergency shower equipment;
- eye wash equipment;
- eye/face wash equipment;
- combination shower and eyewash or eye/face wash equipment; and
- facilities for disabled persons.

It also includes performance and use requirements for the following supplemental equipment:

- drench hoses; and
- self-contained (portable) equipment.

Large-scale multispray shower equipment, of the type used in major emergency response or military applications, are outside the scope of this standard.

Where eye wash units are included in combination with such equipment, these units are within the scope of this standard.

# Cassie is inaugural Jim Torlach scholar

Cassie Prideaux is the inaugural recipient of a scholarship from the Jim Torlach Commemorative Fund, set up in honour of the late State Mining Engineer.

As part of her studies, Cassie recently spent a month at Resources Safety, under the watchful eye of acting Occupational Health Manager, Lindy Nield, preparing a toolbox presentation on the risks of welding fumes.

She is currently half-way through a science degree, majoring in health and safety, and said she was delighted to be awarded the scholarship for 2007-09 as she had always wanted to work in the mining industry.

'A lot of my friends are doing it and I like the idea of working in a mine and the time off through the roster system. Also the opportunity to travel appeals to me,' Cassie said.

'My mum's friend is an occupational hygienist and travels a lot and is currently based in Madrid – I like the idea of that.'

Her specific project while at Resources Safety was investigating the health effects of welding fumes and control measures, which she will make into a Powerpoint presentation to be used at toolbox meetings.

'I'm analysing equipment used for sampling the composition of the fumes to enable me to give advice on how to minimise fumes and harmful substances that they contain,' Cassie said.

'When I've finished the presentation, I will actually go out to welders to present it. The final version will be put on the Resources Safety website as a toolbox presentation, and I will also draft some fact sheets.'

She said she was being assisted by senior Resources Safety staff, including expert engineers, and was going through a number of research papers on the topic of welding hazards.

'I've also been looking at OSH sites on the internet and compiling pertinent information for the toolbox presentation, which will be checked by the Resources Safety experts before it goes live,' she said.

Cassie has spent a lot of time emailing welding workshops to find out about the equipment they use, and compare what they are using to the material safety data sheets (MSDS) in an effort to determine the composition of welding fumes.

'I am looking at the most commonly used welding materials, such as base metals, fluxes and electrodes, and putting together a fact sheet on welding to make welders aware of the latest safety standards for their industry,' she said.

'Basically, I want to provide a one-stop-shop on the Resources Safety website for safety issues relating to welding fumes."

She said that it was excellent working with the professionals at Resources Safety and she had not realised how much effort goes into a toolbox presentation and the work behind the guidelines and standards.

'I'm also making some great contacts in the industry.

'I'm really enjoying it and I believe there are excellent job prospects in health and safety as it's a job that you can do anywhere in the world. I hope to travel with the job and do different things, and working at Resources Safety is a great start,' she said.

The scholarship covers Higher Education Contribution Scheme (HECS) fees for the three years of study, provided the recipient continues to achieve high performance results annually.


*Cassie Prideaux shows Lindy Nield the welding toolbox presentation*

## The Jim Torlach Scholarship

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

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

The scholarship provides:

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

The 2008 winner of the Jim Torlach Scholarship is Janaya Patterson.

For eligibility criteria and further information, contact:

Pat Gilroy at MARCSTA

Suite 5, 12 Brodie-Hall Drive,
Technology Park
Bentley WA 6102

or the course coordinator for the Bachelor of Science (Health and Safety) at the School of Public Health:

**Phone** 08 9266 7819
**Fax** 08 9266 2958
**Email** HlthSci-ss@exhange.curtin.edu.au

From www.publichealth.curtin.edu.au

# Asbestos exposure during mining


Asbestiform minerals occur naturally in many parts of Western Australia. However, asbestos only forms under rare geological circumstances, and the regions with potential for asbestiform minerals can be defined on geological maps. In 1992, the Geological Survey of Western Australia (GSWA) published a 1:2,500,000 map showing the distribution of rocks likely to contain asbestiform minerals.

While asbestos has not been actively mined since the closure of Wittenoom in 1966, contaminant asbestos is commonly encountered during mining activities in particular areas — many of these are within the regions identified on the GSWA map.

The mining occupational health section of the Resources Safety website has several guidelines and a poster on identifying and managing asbestos exposure during drilling and mining operations. They cover the hazards and potential health risks from excessive asbestos exposure. The guidelines are currently being reviewed to incorporate other updated guidelines and standards.

Resources Safety manages the CONTAM system, a database that stores personal exposure data collected by Western Australian mining and exploration companies for compliance with a quota requested by the Mines Inspectorate.

Extensive personal air monitoring is being undertaken to check the effectiveness of control procedures and to assess employee exposure to asbestos fibres. This involves wearing a sampling pump equipped with a membrane filter. Individual fibres on the filter are subsequently counted by an accredited laboratory.

In 2003, the exposure standard for chrysotile was reduced from 1 fibre/ml (f/ml), to 0.1 f/ml, which is the current exposure standard for all types of asbestos, including crocidolite, chrysotile, amosite, actinolite, tremolite and anthophyllite.

The Federal Government has established the National Research Centre for Asbestos Related Diseases, hosted by The University of Western Australia. Part of its research involves the epidemiology and community consequences of asbestos exposure in Western Australia. There are very few community asbestos exposure figures available, so Resources Safety has provided a summary of depersonalised exposure data from CONTAM to assist in the research.

Table 1 is an edited version of 20 years of sampling data extracted from CONTAM for selected occupations and provided to the National Research Centre. It shows that employee exposure to asbestos fibres is consistently well below the allowable occupational exposure standard for asbestos.

Most of the samples were taken from the gold, iron ore and nickel mining sectors, reflecting the increased probability of encountering asbestos mineralisation during mining for those commodities. The data are shown in Table 2.

**Table 1 Personal exposure monitoring for asbestos in Western Australia by selected mining occupations from 1986 to 2007**

| Occupation descriptions | Number of samples | Arithmetic mean (f/mL) | Maximum level (f/mL) | Minimum level (f/mL) | Standard deviation |
|---|---|---|---|---|---|
| Miner or miller (surface) | 3,546 | 0.03 | 3.80 | 0.01 | 0.11 |
| Miner or miller (underground) | 2,029 | 0.03 | 0.62 | 0.01 | 0.04 |
| Semi-skilled or process worker | 886 | 0.04 | 3.45 | 0.01 | 0.16 |
| Labourer | 2,613 | 0.03 | 6.00 | 0.01 | 0.14 |

**Table 2 Personal exposure monitoring for asbestos in Western Australia by selected commodity from 1986 to 2007**

| Occupation descriptions | Number of samples | Arithmetic mean (f/mL) | Maximum level (f/mL) | Minimum level (f/mL) | Standard deviation |
|---|---|---|---|---|---|
| Gold | 5,017 | 0.03 | 3.45 | 0.01 | 0.10 |
| Iron Ore | 1,417 | 0.02 | 3.50 | 0.01 | 0.10 |
| Nickel | 3,353 | 0.03 | 3.80 | 0.01 | 0.09 |

# National Research Centre for Asbestos-Related Diseases

The National Research Centre for Asbestos-Related Diseases (NRCARD) is a consortium of 11 researchers investigating causes and cures for asbestos-related diseases, such as mesothelioma.

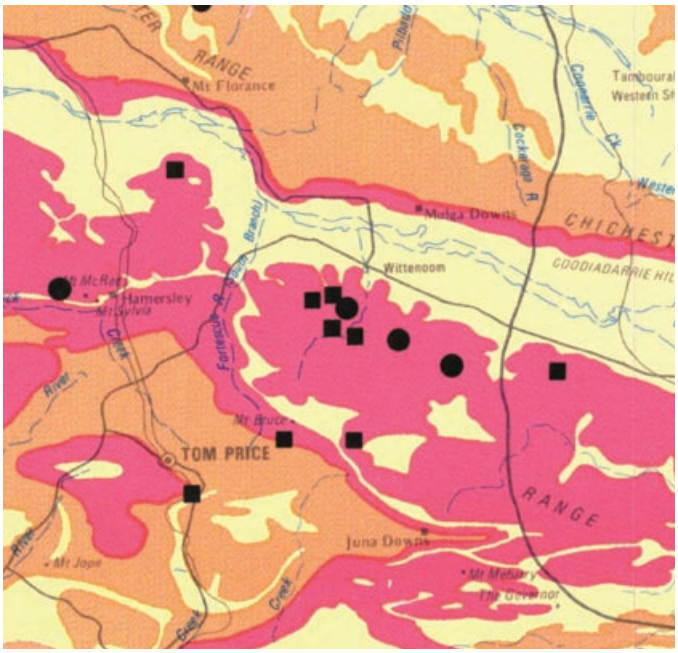
NRCARD was established in late 2006 to:

- provide a platform to build on Australia's existing research expertise;
- provide a focus for collaboration among Australia's leading researchers in the asbestos-related diseases area; and
- encourage strong organisational and research linkages with various research institutions to ensure that research is systematic and complements existing research efforts.

With mesothelioma and other asbestos-related diseases on the rise worldwide, NRCARD provides new hope of fast-tracking much-needed medical breakthroughs through undertaking world-class research into the genetic and environmental causes of these devastating conditions.

For more information about NRCARD, visit www.nrcard.org.au

From www.waimr.uwa.edu.au/centres.html


| OCCURRENCE CATEGORY | GEOLOGICAL SETTING | GEOGRAPHIC DISTRIBUTION | ASBESTOS MINERALS RECORDED | OCCURRENCE OF ASBESTOS MINERALS |
|---|---|---|---|---|
| Very low probability of encountering asbestos minerals | Faults<br>Dykes<br>Pegmatites | Throughout the State; some larger faults, dykes and pegmatites shown on State Geological Map | Chrysotile<br>Anthophyllite | Associated with dyke minerals, and/or host rock cut by faults, dykes, and pegmatites |
| Low probability of encountering asbestos minerals | Generally associated with gneissic rock of high-grade regional metamorphism | Southwest<br>Ashburton<br>Pilbara<br>Glascoyne<br>Murchison<br>Warburton | Chrysotile (White Asbestos)<br>Anthophyllite<br>Tremolite<br>Actinolite | Widespread, but not common; related to alteration of olivine and amphibole-rich rocks |
| Medium probability of encountering asbestos minerals | Generally associated with<br>(i) basic and ultrabasic rocks of the greenstone belts;<br>(ii) basic and ultrabasic intrusions | (i) Yilgarn and Pilbara Cratons<br>(ii) Kimberley and Pilbara Regions | Chrysotile (White Asbestos)<br>Anthophyllite<br>Tremolite<br>Actinolite | Widespread, but mainly local low to high concentrations, related to faulting and shearing of olivine and amphibole-rich rocks |
| High probability of encountering asbestos minerals in host formations | Associated with<br>(i) specific geological horizons of the Marra Mamba and Brockman Iron Formations<br>(ii) banded iron-formations | Pilbara (Hamersley Range)<br>Ord Range | Crocidolite (Blue Asbestos) | Several small iron seams occur in the Marra Mamba Iron Formation; the main concentration is in the Brockman Iron Formation and in a number of seams in the Dales Gorge Member; minor deposits in the Ord Range |

● ASBESTOS MINING LOCALITIES ■ ASBESTOS OCCURRENCE LOCALITIES


CROCIDOLITE [Blue Asbestos; $Na_2Fe_3Fe_2(Si_8O_{22})(OH,F)_2$] - long fibre.

*Selected detail from* Regions with the potential for asbestiform mineral occurrence, Western Australia*, a GSWA map compiled by S.J. Brice in 1992. Available from www.doir.wa.gov.au/gswa*

# Review of hazardous manual tasks in WA mining

Musculoskeletal disorders from performing hazardous manual tasks continue to represent more than a third of all reported accidents in all industrial sectors in Australia. Mining injury statistics in Western Australia reflect national statistics.

In August 2007, the Australian Safety and Compensation Council (ASCC) declared *The National Standard for Manual Tasks at Work* (National Standard) and *The National Code of Practice for the Prevention of Musculoskeletal Disorder from Performing Manual Tasks at Work* (National Code). However, this guidance material does not provide advice specifically related to mining.

As reported in the May 2008 issue of *MineSafe* (vol. 17, no. 1), Resources Safety commissioned a scoping study, *Review of Manual Task Injuries in the WA Mining Industry*, to identify and implement best practice manual handling and ergonomic strategies to significantly reduce the incidence of musculoskeletal injuries to employees in the Western Australian mining industry. The project's recommendations received broad support from the Mining Industry Advisory Committee (MIAC) and encouragement to progress the next stage.

## Stage 1

Stage 1 of the project reviewed available information sources and statistics, and consulted with representatives from industry and regulators. The project recommendations are:

- Resources Safety takes a leadership role in the development and implementation of strategies;
- engage all stakeholders in the process by way of a tripartite working group;
- increase the state of knowledge of manual task risk;
- undertake manual task industry education activities;
- implement a 'systematic manual task risk management process', recommending a 'participative ergonomics approach'*;
- develop or modify manual task risk management guidance;
- develop and administer a shared 'hazardous manual task solution base';
- use AXTAT** information on manual task accident and injury statistics for industry and enforcement;
- establish formal collaborative arrangement between Resources Safety and the Queensland Department of Mines and Energy and the New South Wales Department of Primary Industries;
- maintain up-to-date knowledge of manual task projects and activities;
- develop manual task high impact function audit tool; and
- consider developing specific manual task legislation.

** The participative ergonomics approach to managing risks associated with manual tasks assumes that the people performing the tasks are the experts and must be involved at each stage of the risk management cycle.*

*** The AXTAT database is used by Resources Safety to record and retrieve information about lost time and disabling injuries resulting from accidents in the workplace.*

## Stage 2

### *Stage 2.1 Increase state of knowledge of industry*

*Develop a series of fact sheets*

- Manual task terminology
- Extent and cost of manual task injuries in the Western Australian mining industry
- Causation of musculoskeletal disorders from performing manual tasks at work
- The manual task risk management process
- The participative ergonomics approach
- Whole body vibration
- Hand-arm vibration
- Reducing injury risks associated with mining equipment
- Safe design
- Manual task legislation

### *Stage 2.2 Reference webpage*

*Consolidate existing useful information*

- Manual task webpage
  - References
  - Solutions for specific manual task hazards
  - Case studies of best practice management

### *Stage 2.3 Education*

*Develop simple toolbox presentations*

- Publish on manual task webpage
  - Generic
  - Task specific
- Present at Resources Safety's annual Mines Safety Roadshow

### *Stage 2.4 Collaboration*

*Establish formal processes*

- Adopt risk assessment tool previously tested in underground coal mines in Queensland and New South Wales

### *Stage 2.5 Consultation*

*Establish tripartite working group*

- Trial the risk assessment tool previously tested in underground coal mines in Queensland and New South Wales, across the Western Australian mining industry
- Identify existing solutions for the higher incident injuries
- Develop solutions for the higher incident injuries
- Develop targeted guidance material for the higher incident injuries

## Stage 3

### *Stage 3.1 Develop and update guidance material*

*Collaborative development – nationally uniform guidance*

- Develop and adopt mining specific guidance material, in line with the National Standard and National Code

### *Stage 3.2 Audit tool*

- Develop manual tasks audit tool for Western Australian resources sector
- Trial and assess efficacy of manual tasks audit tool
- Educate inspectorate and industry

### *Stage 3.3 Review and maintain*

- Update and maintain solutions base
- Continual education program

## Participation

To contribute to the project or obtain further information, contact Lindy Nield, acting Occupational Health Manager (**phone** 08 9358 8088; **email** lnield@docep.wa.gov.au).

# Managing noise to conserve hearing

Mining can be a very noisy occupation. Explosives, fixed plant and hand-held equipment are all sources of excessive noise levels. Controlling occupational noise and minimising exposure to it while at work are important aspects of conserving hearing. However, all exposures to excessive levels of noise can damage your hearing.

To ensure the protection of workers from occupational hearing loss, the Mines Safety and Inspection Regulations 1995 include a comprehensive set of noise control regulations (detailed in Part 7 Occupational Health). Some specific requirements are listed below.

- Noise is to be reduced as far as practicable to ensure exposures are below the action level of 85 dB(A) or 140 dB(lin) for peak noise levels.
- Reduce noise through engineering control methods primarily, and then by reducing the duration of exposure to noise.
- Personal hearing protectors offer an interim control.
  - When used they must be selected and maintained in accordance with Australian Standard AS/NZS 1269 Set:2005 *Occupational Noise Management Set*.
  - Safety warning signs must be displayed in areas where employees may be exposed to noise levels above the action level.
  - Information, instruction and training about hearing risks, steps to reduce risks, and how to use and maintain hearing protectors must be provided.
- Noise reports to provide information on exposures of all people at risk are required in the first 12 months of operation, when conditions change significantly, and after five years from the last noise report.
  - Resources Safety must be notified of the report within six months of completion.
  - The contents must be communicated to everyone considered by the manager to be at risk.
  - The noise report is to be made available to inspectors and employees upon request.
- Noise control plans that set out ways of reducing noise at the workplace are to be prepared and implemented.

In 2002, Resources Safety raised concerns over trends towards increased hearing losses among mine workers and introduced a noise exposure monitoring (dosimetry) program for the mining industry. The aim of this program is to check the effectiveness of noise control measures taken to reduce workers' exposures to noise, in much the same way exposure to dust and hazardous substances are monitored for the CONTAM system. Companies are encouraged to regularly monitor noise exposures and submit results to Resources Safety, in accordance with the *Procedure for personal noise exposure recordings*.

At this stage, the number of dosimetry results submitted to Resources Safety is insufficient to draw statistically significant conclusions. However, a recent preliminary analysis comparing noise dosimetry results with hearing data produced the following findings.

- Most employees are working extended shifts lasting 12 hours. With this, noise exposures are increased and recovery periods have decreased.
- Of the 8,177 records assessed, 68% of noise exposures were above the action level of 85 dB(A).
- Higher risk occupations are, in decreasing order, from underground workings (production and services), railway operations, ore treatment and processing operations, and maintenance workshops.
- About 75% of employees in underground workings had noise exposures above 90 dB(A), of which 22% exceeded 100 dB(A).
- Analysis of the hearing data collected for the MineHealth system indicates a distinct trend towards deteriorating hearing in Western Australian mining employees. This mirrors measured noise exposure levels.
- By comparing changes in threshold shifts in either or both ears,

Continued on page 32...

## Basic rules of working with noise

- Noise levels are described in decibels (dB)
- Noise levels can not be added or subtracted in the usual arithmetic way because the dB scale is logarithmic
- Two identical tools emitting noise of 90 dB(A) produce the combined noise level of 93 dB(A), not 180 dB(A)
- A 3 dB(A) increase corresponds to a doubling of sound energy
- A 10 dB(A) increase corresponds to a 10 times increase of the sound energy
- A 20 dB(A) increase corresponds to a 100 times increase of the sound energy

The sound level conversion (SLC80) rating of a hearing protector, ear plugs or headset is a simple number and class rating derived from a test procedure outlined in the Australian Standard AS/NZS 1270:2002 *Acoustics – Hearing protectors*.

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according to Australian Standard AS/NZS 1269.4:2005, it is possible to identify significant threshold shifts, experienced as hearing damage. Early identification is necessary to trigger employers to activate a rigorous hearing conservation program for at-risk employees.

- Analysis of noise audits since 1998 indicates that compliance levels have not significantly changed, with an average level of about 62%, and only 19% of mines audited in the past three years achieving full compliance.
- The main areas where mines under-perform are:
  - noise control policy;
  - noise control plan;
  - 'buy-quiet' process; and
  - information, instruction and training.

*More can be done and it should be viewed as a priority by everyone in the mining industry. If you work in a noisy area, consult your manager to find out how to reduce your occupational exposure to noise and conserve your hearing.*

Apart from the safety issues of not being able to hear warnings and sirens, hearing loss is an awful condition that negatively impacts the quality of life of the sufferer, as well as the sufferer's family and workmates. Understanding the contributions of excessive noise exposures at work combined with personal choice to listen to loud music at work and home is important for protecting your own hearing as well as that of your colleagues.

To address the findings of these preliminary investigations, occupational health inspectors from Resources Safety will be targeting noise control and hearing conservation programs during 2008 and 2009. Mining companies are encouraged to visit the Resources Safety website and download the noise audit to check their own compliance.

To highlight the issues associated with excessive noise exposures and hearing loss, this topic features at the 2008 Mines Safety Roadshow in October.

## Hearing protection innovation

After other noise-reduction controls have been introduced, hearing protection may be used to address residual risks but needs to consider the following:

- select for protection, user preference and work activity;
- guard against over-protection — isolation can lead to under-use and safety risks;
- users will require information, instruction, training, supervision and motivation; and
- any equipment will only protect if maintained and worn properly all the time during exposure.

Off-the-shelf disposable ear plugs and ear muffs have been around for many years, but are not always the best solution to prevent noise-induced hearing loss. Just a few of the innovative features now available in protection devices are:

- customisation to suit the user and work requirements;
- adjustable attenuation levels;
- technology that allows noise to be suppressed but speech remains clear and audible, so users can converse in a noisy environment without compromising either communication or hearing protection; and
- use of Bluetooth® technology so users can take and make mobile phone calls without removing hearing protection.

Western Australia has been a leader in developing technology to address some of the issues associated with hearing protection. The Western Australian Telecommunications Research Institute (WATRI) is a joint venture between Curtin University of Technology and The University of Western Australia. It focuses on world-class research and development, and commercialisation of research through the establishment of startup companies, one of which owns innovative technology enabling speech communication to be heard in high noise environments without removing hearing protection.

## Information

The following guidance material and publications are available from the Resources Safety website at www.docep.wa.gov.au/ResourcesSafety in the mining section:

- Noise control in mines — guideline*
- Noise — audit guidelines and template
- Occupational noise in the WA mining industry — toolbox presentation
- Managing occupational noise in the workplace — Mine Safety Matters brochure*
- Occupational noise management in mining — poster*
- Protect your hearing — poster*
- Procedure for personal noise exposure recordings — procedure
- Personal noise exposure recordings sheet — form
- Notification of a noise report — form
- Application for approval as a noise officer — form

* These items are available in hardcopy format. Download the order form from the publications section of the website or contact Publications and Promotions, Resources Safety:

**Phone** 08 9358 8178
**Fax** 08 9358 8188
**Email** RSDComms@docep.wa.gov.au

# Occupational health news

## DPM in underground mines matters

A recent review of CONTAM data for 2006 and 2007 revealed that one in four exposures to diesel particulate matter (DPM) in underground mines exceeded the recommended exposure standard.

The standard of 0.1 mg/m3 is based on National Institute for Occupational Safety and Health's NIOSH Method 5040, which measures elemental carbon of the respirable fraction. Filter cassettes that specifically collect diesel particulate matter have been commercially available for the past few years.

In view of these results, occupational health inspectors from Resources Safety will be targeting DPM and other diesel pollutants in underground environments.

For information on diesel exhausts and analytical methods, visit the NIOSH website at www.cdc.gov/NIOSH


## HSIS update

The Australian Safety and Compensation Council (ASCC) has updated the listing of classified hazardous substances on the *Hazardous Substances Information System* (HSIS) online database to reflect changes in Europe's 29th Adaptation to Technical Progress to Directive 67/548/EEC.

The update comprises 919 entries, of which there are 465 amendments to existing entries and 454 new entries.

All the changes for the HSIS online database are listed on the ASCC website at hsis.ascc.gov.au


## RESOURCES SAFETY PUBLISHES A RANGE OF MATERIAL INCLUDING:

Brochures • Posters • Guidance materials • Toolbox presentations • MineSafe magazine

Department of **Consumer and Employment Protection**
Government of **Western Australia**

Resources Safety

**Email** RSDComms@docep.wa.gov.au **www**.docep.wa.gov.au/ResourcesSafety

# Election notification form goes electronic

Further to the article on using the correct election notification form in the December 2007 issue of *MineSafe* (vol. 16, no. 3), Resources Safety has since enhanced the form and introduced electronic submission. This eForm is available on the Resources Safety website.

As required by the *Mines Safety and Inspection Act 1994* (section 56), a notice must be given in writing and specify the day on which the election was completed, and must be submitted not later than the seventh day after the election date.

The term of the elected person is two years, commencing on the tenth day after the election date.

The notification form is available from Resources Safety website at www.docep.wa.gov.au/ResourcesSafety in the mining forms section. The person conducting the election is required to complete and submit this form for all elected representatives, even when elected unopposed.

It is particularly important that the forms are correctly completed to maintain the quality of the data stored in Resources Safety's SHR database. Only fully completed notification forms will be accepted — incomplete forms will be returned to the approved person to complete before they are processed further.


Notification of election of safety and health representative(s)

## Using the eForm

As an eForm, there will be some fields that are 'compulsory' or have limits (e.g. date field cannot be set to a future date), and the form will not submit if the fields do not comply with the preset parameters.

The form can be printed at any stage and may be saved – the latter is a particularly useful feature as it reduces data entry if sending in multiple forms or notification is a common activity.

Guidance on completing the fields is given below in line with the numbers on the form.

### *Election details*

1. Indicate the number of safety and health representatives elected on the specified day.

   *Note: Given that notification is to be sent within seven days of the election, a time limit has been for the date field.*

3. Provide details of the person who conducted the election, including surname, given names, designation and 'signature'.

To sign an eForm, the person who conducted the election will need to either:

- print the form and sign then post or fax it (email functionality not available); or
- use an electronic signature using Adobe Acrobat.

To set up the electronic signature, click on the 'Signature' field and a popup message box from Adobe will guide you through the process. You only need to do this the first time, unless your logon name changes or you already have a digital ID with Adobe.

### *Schedule*

1. Details of the person elected, including surname, given names, contact details, occupation, period in current position (this may be with several employers for one occupation; e.g. shotfirer for three employers over 11 year period) and period with current employer.

*Note: Under section 56 (8b)(b) of the Act, a person is not eligible to be elected as a safety and health representative for an underground mine unless the person has had a total of at least 12 months' experience as a person engaged in underground mining operations.*

2. Details of the principal employer, including the registered business name, business address (mailing address) and contact details.

3. Details of the mine(s) elected to represent, including name of the mine or mines, and mine site ID if known, or select exploration or service provider if one of these is more appropriate.

*Note: The site name (and mine site ID, if known) must be provided unless the person is not elected for a particular mine site or sites (i.e. is involved in mineral exploration not on a mine site or works for an employer servicing mine sites, such as earth-moving contractors, contract drillers or caterers). The mine site ID is the six-digit number (previously started with letter 'S' but now starts with a zero) allocated by Resources Safety to represent an administrative group for a mining operation (e.g. underground mine, several open pits and a processing plant) and is used to report to AXTAT, CONTAM and MineHealth.*

Indicate whether the person has been elected to:

- perform functions in respect of particular matters (e.g. introduction of a new process), areas (e.g. administration, underground workshop) or kinds of work (e.g. shotfiring); or
- represent a group of employees (e.g. all truck drivers; a particular underground shift).

4. (a) Indicate whether or not the person has been previously elected as a safety and health representative and, if so, the number of times.

   (b) Indicate whether the person has attended an accredited introductory training course for safety and health representatives.

*Note: Training may not happen until after the election if the person has not previously been elected, in which case select 'has not attended'. Only elected safety and health representatives who have completed the relevant training have the power to issue provisional improvement notices (PINs) to address specific safety and health matters at the mine.*

***Submission of form***

The completed form can be submitted electronically to Resources Safety by clicking on the 'Submit by email' button located on the top righthand side of the form.

For further information, contact Tse Yin Chang, Publications and Promotions Administrative Officer, at:

Resources Safety, DOCEP
Locked Bag 14
CLOISTERS SQUARE WA 6850

**Phone** 08 9358 8178
**Fax** 08 9358 8188
**Email** mineshreps@docep.wa.gov.au

## National Quality Council recognises WorkSafe resources

In the May 2008 issue of *Minesafe* (vol. 17, no. 1), we reported on formal recognition of safety and health representative introductory training via the Certificate III in Occupational Health and Safety (Certificate III in OHS).

In consultation with training providers, WorkSafe has developed assessment guidelines to support safety and health representatives seeking skills recognition against six units of the Certificate III in OHS that are equivalent to the introductory training course.

There is no mandatory requirement for assessment of competencies, and the decision as to whether to seek skills recognition into the Certificate III in OHS is entirely at the discretion of the elected safety and health representative. In cases where providers charge an additional cost for assessment of competencies, an employer would have to agree to meet that additional cost.

Following a period of use by providers and subsequent enhancements, WorkSafe has had the Certificate III Integrated Assessment Tool (Certificate III tool) evaluated against the National Quality Council (NQC) Quality Principles by a Department of Education, Employment and Workplace Relations approved Consultant. The Certificate III tool was found to meet the NQC Quality Principles and was noted by the NQC (www.nqctvetaustralia.com.au) on 6 June 2008.

The Certificate III tool now has the 'noted tick' logo on the front, indicating it is a nationally recognised and approved resource that training providers can use with confidence.

Safety and health representatives seeking skills recognition against six units of the Certificate III in OHS should contact their introductory training course provider for further information.

All photos TYC


# SAFE WORK IS ABOUT PREVENTING WORKPLACE INCIDENTS AND MANAGING INJURIES

During Safe Work Australia Week (19-25 October 2008), WorkSafe and WorkCover WA encourage Western Australian workplaces, occupational safety and health organisations and practitioners and rehabilitation providers to have an extra focus on safety and health, and injury management.

Workplaces right across Australia get involved by organising events and activities during the week.

Get thinking about a safety or injury management event or activity for your workplace now!

Contact WorkSafe (telephone 08 9327 8608, email promotions@docep.wa.gov.au) to register your event or activity. You will receive a free SWA Week poster kit, including promotional items.

All registered events or activities will be listed on the SWA Week webpage at www.worksafe.wa.gov.au/SWAWeek and go in the draw to win a ticket to a Mine Safety Roadshow or the Perth Work Safe Forum.

In 2007, some 140 events or activities were registered — check them out on the SWA Week webpage to get ideas about what you could do. The webpage also has a very useful brochure with:

- list of suggested activities
- step-by-step guide to planning and organising a workplace event or activity
- contact details for more information.

**MINESAFE INVITATION** Resources Safety invites mining operations that participate in Safe Work Australia Week 2008 to send photographs and brief descriptions of their events or activities to appear in the next issue of MineSafe. Contact the Editor, Telephone: 08 9358 8149 or Email: RSDComms@docep.wa.gov.au

# DOCEP presents OSH

Before the year ends, the Department of Consumer and Employment Protection (DOCEP) will present or participate in a number of events highlighting occupational safety and health, as described below.

## WA Safety Show

When: 12-14 August 2008

Where: Perth Convention Exhibition Centre

Information:
www.wasafetyshow.com

DOCEP is the principal sponsor of the inaugural WA Safety Show and Conference. The WA Safety Show will host over 150 exhibitors and showcases the latest occupational safety and health solutions.

The DOCEP exhibit comprises Energy*Safety*, Resources Safety and WorkSafe. Resources Safety will staff the booth from 10 am until 2 pm on Thursday 14 August.

The concurrently held WA Safety Conference, presented by the Safety Institute of Western Australia, will feature more than 30 Australian and international speakers addressing topics as diverse as workplace wellness and critical incident investigations.

## 2008 Mines Safety Roadshow

When: October 2008

Where: Kalgoorlie, Bunbury, Karratha, Perth

Information:
www.docep.wa.gov.au/events

This is the fourth in the series of annual Mines Safety Roadshows held in Perth and regional centres through Western Australia.

There will be a mix of presentations and break-out sessions, including safety videos, hands-on exercises and group discussions.

Presentations will address a variety of occupational safety and health issues, with two themes running through the program – safety culture and consultation.

## Perth Work Safe 2008 Forum

When: 23 October 2008

Where: Perth Convention Exhibition Centre

Information:
www.docep.wa.gov.au/events

The keynote speaker for this year's event is Professor Niki Ellis, an occupational health expert from the University of Queensland. She will talk about the effects of working under continued stress on the safety, health and wellbeing of workers.

Well-known football identity Kevin Sheedy will talk about the importance of good workplace safety leadership, teamwork and consultation to make sure workers 'come home safe'. *Come home safe* is the 2008 forum theme.

Plenary speakers include Clive Brown, Chair of the National Mine Safety Framework Steering Group, and Tony Cooke, Chair of the Commission for Occupational Safety and Health.

## 2008 Exploration Safety Roadshow

When: Wednesday, 26 November 2008

Where: Technology Park Conference Centre, Bentley

Video conference* venue:
WMC Conference Centre, 44 Macdonald Street, Kalgoorlie

** As a trial run for future events, Resources Safety will 'feed' the Perth proceedings to Kalgoorlie, with the opportunity for two-way interaction.*

Information:
www.docep.wa.gov.au/events

Exploration managers and other employers with staff working on exploration leases (e.g. drilling contractors, surveyors) have duties under the *Mines Safety and Inspection Act 1994* to ensure that exploration activities are carried out in accordance with the Act.

The 2008 Exploration Safety Roadshow will supplement occupational safety and health information presented at the 2008 Mines Safety Roadshow, with a mineral exploration focus on topics including:

- legislative responsibilities, including statutory appointments;
- duty of care obligations, particularly in remote locations, as an employer, employee and self-employed person;
- reporting requirements; and
- specific occupational safety and health topics such as compressed air, hazardous manual tasks, dust and noise.

Companies with remote sites interested in participating in the video conference are invited to contact Resources Safety (RSDComms@docep.wa.gov.au) to register their interest. For technical requirements, the company's IT department should contact Tony Kubicki of ConferWest (telephone 08 9258 0725, email conferwest@dtf.wa.gov.au).

Further information, including the registration brochure, will be added to the DOCEP events page as it becomes available.

RESOURCES SAFETY PRESENTS THE 4TH ANNUAL

# Mines Safety ROADSHOW 08

## DATES & VENUES

| | | |
|---|---|---|
| **KALGOORLIE** | **Tuesday, 14 October** | WASM Graduates Hall, 44 MacDonald Street |
| **BUNBURY** | **Thursday, 16 October** | Lighthouse Beach Resort, Carey Street |
| **KARRATHA** | **Tuesday, 21 October** | Karratha International Hotel, Millstream Road |
| **PERTH** | **Friday, 24 October** | Perth Convention Exhibition Centre, Mounts Bay Road (follows Work Safe Forum 23 October) |

## PROGRAM

Registration from 8.30am for 9am start at regional venues, and 8am for 9am start at Perth venue. The program will run from 9am to 3pm.

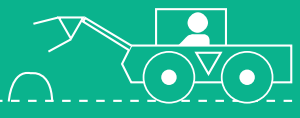
Two themes will run through the program - **SAFETY CULTURE** and **CONSULTATION**.

Specific presentations and break-out sessions will cover:

**OCCUPATIONAL HEALTH**
INCLUDING MANUAL TASKS, NOISE & WELDING
**HAZARD IDENTIFICATION**
**INCIDENT REPORTING**
**COMMUNICATION**
**CONSULTATION**

## REGISTRATION & QUERIES

Registration fee of $66 (including GST) per person covers morning tea, lunch and roadshow pack. Early registration is recommended to secure your place. **Registration brochures are available online from www.docep.wa.gov.au/events, phone 08 9358 8154 or email RSDComms@docep.wa.gov.au**



# Significant incident report

**Mines Safety**
**Significant Incident Report No. 150**
**Released 16 June 2008**

## Failure of escape ladderway in underground rise

### Incident

During a routine inspection, segments of a 100 m long underground ladder were found in a twisted and broken pile at the bottom of an escape ladder rise to surface. About 45 m of ladder were found at the base of the rise.

The ladder was constructed of galvanised tubular steel sections and manufactured in a modular system for ease of installation from the top of the vertical rise using a crane.

As is quite common in the area, the rise was subject to localised inflows of hypersaline water.

The ladder had been installed only four years prior to its failure. There was no substantive corrosion on the modular sections recovered from the bottom of the rise.

### Immediate causes and contributing factors

- A significant amount of salt build up was apparent from the material at the bottom of the rise. This would have added to the total load suspended from the ladder mountings.
- The apparent failure may have been associated with breather holes in the ladder sections, which are required for cooling and moisture removal during the hot dip galvanising process.
- There were also failures alongside welds located for mounting and pinning brackets.
- There appeared to be some internal corrosion, under the galvanised coating, in the vicinity of the breather holes on one section of the ladder. This might well have been the initial cause of the failure.
- The ladder modules have three main structural elements (standard side-by-side step-over ladder arrangement). Internal corrosion in one structural element could cause the load on the ladder to exceed the load carrying capacity of the adjacent components.

### Comments and preventative action

- An in-depth inspection should be carried out of all escape ladderways to check for and monitor internal and external corrosion. Care should be exercised during the examination process in case it causes traumatic failure of a ladderway component weakened by corrosion, as in this case.
- Extraneous material such as salt loading and loose rocks should by systematically removed.
- Joints, welds and breather holes should be carefully examined for signs of impending failure.
- Design and load carrying capacity from engineering calculations should be available at the mine.
- Intermediate support brackets, plates, bolts and cross members should be carefully checked during regular inspections.
- Regular thickness testing should be conducted on the ladderway structure.
- Every third ladder module should have a bracket against the wall. The bracket should be fixed to the wall with an M20 hot dipped galvanised chemical anchor bolt. Retro-fitted brackets to existing ladderways should have appropriate steel protective treatment.
- The bottom of every ladderway should have two brackets against the floor. The brackets should also be fixed to the floor with M20 hot dipped galvanised chemical anchors. The brackets should also be concreted in with a substantial concrete block. Retro-fitted brackets to existing ladderways should have appropriate steel protective treatment.
- Every galvanising breather hole should be totally sealed with an appropriate plastic plug. The engineering drawings for new ladderways should specify that the galvanisers supply and fit appropriate plastic plugs that totally seal the breather holes.

# Exploration Safety

## Roadshow 08

Photo courtesy Millennium Minerals Ltd

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- legislative responsibilities, including statutory appointments;
- duty of care obligations, particularly in remote locations, as an employer, employee and self-employed person;
- reporting requirements; and
- specific occupational safety and health topics such as compressed air, hazardous manual tasks, dust and noise.

*When:* **8am, Wednesday, 26 November 2008**

*Perth venue:* **Technology Park Conference Centre, Bentley**

*Video conference* venue:* **WMC Conference Centre, 44 Macdonald St, Kalgoorlie**

* As a trial run for future events, Resources Safety will 'feed' the Perth proceedings to Kalgoorlie, with the opportunity for two-way interaction.

Companies with remote sites interested in participating in the video conference are invited to contact Resources Safety to register their interest. Sites will need to provide their own equipment. Resources Safety will cover the call charges. For video conferencing technical requirements, the company's IT department should contact Tony Kubicki of ConferWest **Telephone** 08 9258 0725 **or Email** conferwest@dtf.wa.gov.au

Registration fee of $44 (including GST) per person covers morning tea and roadshow pack. Early registration is recommended to secure your place. Registration brochures are available online from **www.docep.wa.gov.au/events**, phone **08 9358 8154** or email **RSDComms@docep.wa.gov.au**

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