



MineSafe

Western Australia



**2006 Surface Mine
Emergency Response
Competition**



**Working hours
code of practice** page 7

**How WA mining performed
in 2004-05** page 13



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.

In this issue

This mid-year edition of *MineSafe* is a bumper issue covering many topics. The *MineSafe* mailing list continues to grow and the hardcopy publication will be distributed to more people than ever before, as well as being available online.

The July issue starts with the regular feature from the State Mining Engineer, and information on the incumbent, Martin Knee, for those not familiar with his position. Martin has provided an obituary for his predecessor, Jim Torlach, who played a critical role in mine safety in the State.

There is information on the second Mines Safety Roadshow, which will be presented in October 2006, and we encourage anyone with an interest in mines safety to attend. This year's program has an information session on the working hours code of practice, which is very relevant to the mining industry with its variety of work situations.

We continue the series on other divisions in the Department of Consumer and Employment Protection with an overview of EnergySafety.

Recently released Resources Safety publications are featured throughout the issue, including the guideline on general duty of care in Western Australian mines, updated procedures for using the CONTAM system, and the 2004-05 overview of safety performance in the minerals industry. Readers are encouraged to check out the Resources Safety website regularly to find out what's new — updates and new information are posted there first.

There are several articles and a double-page pictorial spread on the 2006 Surface Mine Emergency Response Competition. Such competitions play a significant role in terms of training, and maintaining and upgrading skills. They also perform an important networking function, facilitating the exchange of ideas and techniques. Resources Safety is pleased to continue supporting these competitions through the involvement of inspectorate staff.

We report on some safety innovations and awards, as well as passing on safety alerts released by other Australian jurisdictions but relevant to the Western Australian scene. Specific safety advice is also included in an article on safer sand mining, and the safety bulletin on telehandlers.

Local news includes media releases on the new access road to the Kalgoorlie Explosive Reserve, and the exemption from removal of warning lights on mining vehicles driven on gazetted roads.

In the safety and health representatives section, we continue the theme of looking after inexperienced or young people in the workplace, with some words of wisdom from Doug Austin, a District Inspector.

With the boom in mining in the State, it is important to remain vigilant and we continue to encourage everyone in the industry to adopt safe practices in all aspects of their lives.

Malcolm Russell

Executive Director, Resources Safety

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Face the consequences

Most people working in the mining industry today would be familiar with the concept of risk as a function of probability and consequence — how likely is this to happen and what could be the result if it did?

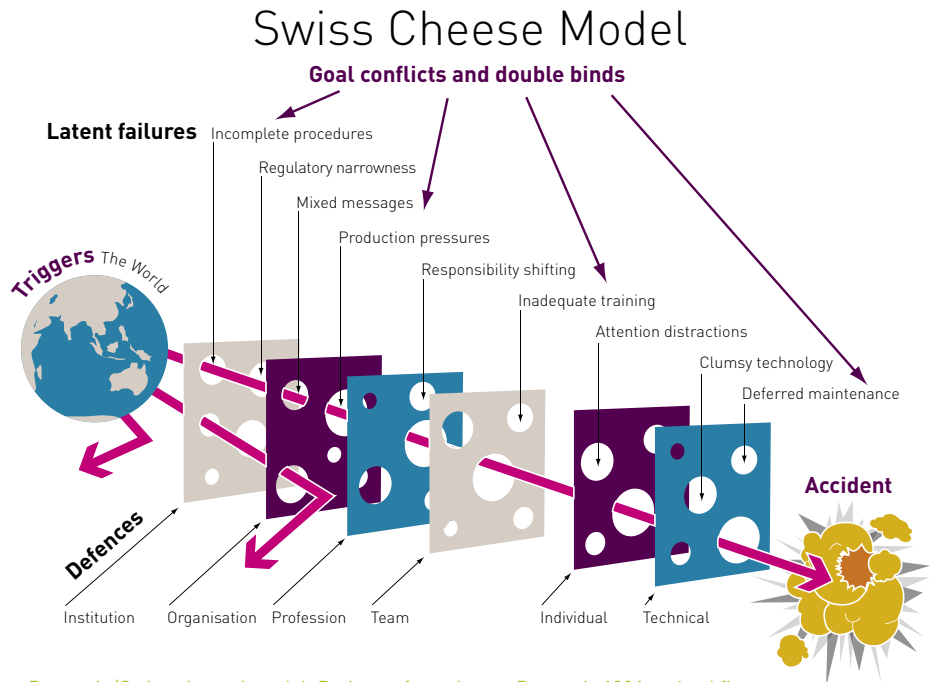
Having established that a risk does exist due to a hazard present in the workplace, there are really *only two* things we can do with it — we can either accept it because our perception of the likely outcome is that the potential harm is small or unlikely, or we can modify it so that the risk becomes acceptable to us. This process is what we generally call risk management:

a systematic use of available information to determine how often adverse events may occur, the magnitude of their consequences and how acceptable the resulting harm may be.

Too often, however, we spend a lot of time and resources trying to manage the probability/frequency/exposure side of the risk equation and lose sight of the consequence side. Just looking at a standard dictionary definition of the word gives an inkling of how misguided that can be:

consequence n. Something that logically or naturally follows from an action or condition

The mines safety inspectorate frequently deals with the outcomes of this kind of mind-set. If the consequence of some adverse event is likely to be death or serious injury, then accepting the risk means accepting that death or injury too. No matter how small the likelihood, if the adverse event happens, the consequence happens. This lies at the heart of James Reason's 'Swiss cheese' model of organisational accidents. Nothing can stop the accident when the holes in the cheese line up.



Reason's 'Swiss cheese' model. Redrawn from James Reason's 1991 revised figure.

The inspectorate deals with many instances of bad outcomes that nobody actively sought. No-one sets out to injure him- or herself; certainly, no-one sets out to die. Employers would rather that their employees did not get hurt. Yet every day, people are injured at work and even killed, because the perception of the risk involved in a task or situation at work does not focus on the potential consequence, but tends to emphasise the small likelihood of an adverse event. No-one expects to win the first division prize in the lottery but, every week, someone does!

The amount of risk — and, by implication, the potential consequence — that people are willing to accept in any given condition depends on their estimations of the advantages and disadvantages of the various risky and cautious behaviour alternatives at their disposal. When the expected benefits of risky behaviour alternatives are high and the expected costs of these are

perceived as relatively low, the level of accepted risk may tend to be high.

Similarly, when the expected benefits of safe behaviour alternatives are low and their costs high, the level of accepted risk may be high.

Thus, the amount of risk to their health and safety that individuals may be willing to accept depends on four (subjective) categories of motivating factors:

- (a) The expected *benefits* of comparatively *risky* behaviour alternatives
- (b) The expected *costs* of comparatively *risky* behaviour alternatives
- (c) The expected *benefits* of comparatively *safe* behaviour alternatives
- (d) The expected *costs* of comparatively *safe* behaviour alternatives.

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The higher the values in categories (a) and (d), the higher the level of risk that may seem acceptable. This acceptable level of risk may be lower as the values in categories (b) and (c) rise. The term 'expected benefit' (or 'expected cost') has two underlying elements:

- the perceived likelihood that a benefit will, in fact, follow from a given behaviour alternative, and
- the size of that benefit.

The benefit may not be financial — it may be something as simple as being able to make the job run along in an easier fashion or being thought to be a 'gun' operator if

an inappropriate level of risk (and consequence) is accepted. The cost is not necessarily measured in monetary terms either. Being thought to be a 'whinger' or 'not a team player' may be one cost of a responsible attitude to risk and its consequences at work.

So, finally, let me ask that every day at work, on the road, at home, you think about *what is the worst thing that could possibly happen here?* Keeping in mind the consequence of taking a risk, rather than just the likelihood of that event happening, may help to save you from serious injury or worse! Let's end with a quote from an American who was smart enough to make billions of dollars during his lifetime and who had to learn about

and teach others to cope with levels of technological risk that were inconceivable when he was a child.

"Whatever failures I have known, whatever errors I have committed, whatever follies I have witnessed in private and public life have been the consequence of action without thought."

Bernard Baruch, 1870–1965, US financier and government adviser.

Baruch grew rich through stockmarket speculation before he was 30. As US Representative to the UN Atomic Energy Commission, he formulated plans for international control of atomic energy.

REFERENCE: Reason, J., 1990, Human error. Cambridge University Press, UK, 316 pp.

Who is the State Mining Engineer?



Martin Knee, State Mining Engineer

The State Mining Engineer is a statutory appointment under the *Mines Safety and Inspection Act 1994*. The person in this position:

- must hold a first class mine manager's certificate of competency,
- has the powers conferred on an inspector by Division 2 of the *Mines Safety and Inspection Act 1994*, and

- controls and directs inspectors engaged in matters relating to mining operations.

Among other responsibilities, the State Mining Engineer approves project management plans before mining commences, determines how records must be kept and submitted to Resources Safety, reviews inspectors' decisions if requested and advises on mining matters.

Martin Knee was appointed State Mining Engineer in July 2001, following Jim Torlach's retirement.

Martin was born in Bristol, England, and educated at the University of Leeds, where he graduated with a Bachelor of Science in Mining Engineering in 1971. He is a Fellow of the Institute of Materials, Minerals and Mining (FIMMM), a Chartered Engineer (CEng) of the Engineering Council of the UK, and a European Engineer (EurIng) of the Fédération Européenne d'Associations Nationales d'Ingénieurs (FEANI) in Paris.

He spent many years in a variety of engineering and managerial positions on the Zambian Copperbelt, worked as Mine Engineer at Tynagh mine in the west of Ireland, and was Mine Manager in charge of the development of the Sohar Copper Project in the Sultanate of Oman.

Martin came to Australia in 1982 and was General Manager of the operations of Gunpowder Copper Limited in Queensland. Subsequently, he was Chief Mining Engineer and Mine Operations Manager at the Agnew nickel mine, Leinster. He also worked as a mining engineer and Mining Superintendent at the Argyle diamond mine before joining what was then the Department of Mines (now Resources Safety Division in the Department of Consumer and Employment Protection) as Regional Mining Engineer and Senior Inspector of Mines, initially in Karratha and then in Perth. He is now Resources Safety's Director of Mines Safety.

Jim Torlach fondly remembered



Jim Torlach, 1989

It is with considerable sadness that I report the death on 31 May 2006 of Jim Torlach, my predecessor as State Mining Engineer. He died quietly at home with his family after

a long and courageous battle with cancer. Throughout his illness, Jim never gave up and refused to become bitter about his lot. This was no surprise to those of us who knew him personally.

Jim was the son of a school teacher and an Anglican pastor. His father served one of the largest parishes in Australia and his family was raised in northern Queensland in the days when pastoral duties saw him away from home for weeks at a time, as he drove over bad roads to visit his parishioners in outlying areas of the bush.

Jim was educated at The University of Queensland and graduated as a mining engineer, having worked at a number of locations around the state, including Mt Morgan. He joined Mt Isa Mines and spent many years there, including setting up the Alimak raise development program and an extensive stint running the shaft-sinking and equipping program that was being conducted at that

time, before moving on to Rosebery in Tasmania where he was the underground production manager.

In 1984, he was appointed as State Mining Engineer for Western Australia, in what was then the Department of Mines, bringing with him his extensive and sometimes very specialised practical knowledge. His achievements in this role were legion, including the modernisation of the inspectorate and setting up an entirely new technical services and occupational health establishment to complement and assist the field inspectors in many technical specialties. The magazine you are reading now was another of the initiatives overseen by Jim, and the black and white photograph of him is from the very first *MineSafe* in October 1989.

Jim's lasting memorial will be his complete overhaul and modernisation of the mine safety legislation, which had been amended piecemeal in previous times, to fully reflect the Robens consultative safety provisions and embody the duty of care while retaining an important leavening of hard-earned lessons from the past. This was very definitely Jim's personal project and was carried out largely unaided — a huge body of work that culminated in the passing of the *Mines Safety and Inspection Act 1994* through the State parliament, where his careful consideration of the views of all sides ensured it had bipartisan support.

Those of us who knew him well would agree that he was one of the most committed and truly valuable people in our industry. He had many interests — his extensive reading on many subjects and great intellectual rigour and intensity were inspirational and made him one of those larger-than-life characters that we meet all too seldom. He leaves a legacy of improvement in mining safety that is second to none.

Above all, Jim was always great fun to work with and had a tremendous approach to his job. His never-failing sense of humour is fondly remembered. He was a friend and mentor to many of us and we will always think of him with great affection as well as admiration. We shall miss him.

Martin Knee
State Mining Engineer



Jim Torlach, 2005

Add to your toolbox

Resources Safety has started a collection of PowerPoint presentations that are ideal for toolbox meetings.

The presentations are available for any non-commercial use, subject to the condition that they are not altered without permission from Resources Safety.

They can be accessed at www.docep.wa.gov.au/ResourcesSafety

in the mining section under guidance material and publications (mine safety toolbox presentations).

The first suite of presentations was derived from those given at the 2005 Mines Safety Roadshow. The latest addition summarises information on safety performance in the Western Australian mineral industry during 2004-05.

Supporting resources, such as brochures and posters, are available from Resources Safety.

For resources, information or clarification, please contact 9222 3229 or ResourcesSafety@docep.wa.gov.au, or visit www.docep.wa.gov.au/ResourcesSafety





Mines Safety Roadshow 2006

Supporting safety and health in the minerals industry

The Resources Safety Division of the Department of Consumer and Employment Protection invites employees and employers in the minerals industry to attend the second Mines Safety Roadshow, coming in October to Kalgoorlie, Bunbury, the Pilbara and Perth.

Anyone with an interest in mines safety is encouraged to attend. The program should appeal to safety and health representatives, supervisors, managers and employers from mining and exploration companies, and occupational health and safety professionals.

Some topics are based on feedback following the 2005 Roadshow, including the role of Resources Safety inspectors, 'appropriate' investigations for safety and health representatives, why reporting data is important and how it can be used in hazard identification, reducing the risk for strains and sprains, machinery hazards, provision of PPE to labour hire workers, and an update of the *Dangerous Goods Safety Act 2004* and implications for the mining industry.

Time is allowed for round-table discussions to encourage networking. The afternoon session will be dedicated to the working hours code of practice, including implications for the minerals industry and practical applications.

Presenters include the State Mining Engineer and WorkSafe WA Commissioner, inspectors and other staff from Resources Safety and WorkSafe, as well as industry and union representatives. The Kalgoorlie Roadshow will be opened by the Minister for Employment Protection, the honourable John Bowler JP MLA.

The registration fee of \$55.00 per person (including GST) covers morning tea, lunch and a resources pack.

The Roadshow provides an excellent opportunity to update your safety and health knowledge and broaden your networks, so we hope to see you there.

Session details

Location	Date & Venue
Kalgoorlie	Monday, 9 October 2006 <i>WASM Graduates Hall, 44 MacDonald St, Kalgoorlie</i>
Bunbury	Friday, 13 October 2006 <i>Quality Hotel Lord Forrest, 20 Symmons St, Bunbury</i>
Karratha	Tuesday 17, October 2006 <i>All Seasons Mercure Karratha, Lot 1079 Searipple Rd, Karratha</i>
Tom Price	Wednesday 18, October 2006 <i>Windawarri (Karijini) Lodge, Pilbara Room, Stadium Rd, Tom Price</i>
Newman	Thursday, 19 October 2006 <i>Newman Hotel Motel, 20 Newman Dr, Newman</i>
Perth	Thursday, 26 October 2006 <i>Hyatt Regency, Terrace Ballroom, 99 Adelaide Tce, East Perth</i>

Program

8.45.....	Registration
9.00 am.....	Welcome and introduction
9.10 am.....	Investigations
10.30 am.....	Morning tea
11.00 am.....	Hazard identification and reporting
12.10 pm.....	Hot topics
12.30 pm.....	Lunch
1.30 pm.....	Working hours code of practice
3.30 pm.....	Close

Early registration is recommended to secure your place.

The Mines Safety Roadshow 2006 registration form can be obtained:

By phoning the Resources Safety Infoline on **1300 855 685** and recording your contact details, emailing

ResourcesSafety@docep.wa.gov.au OR from the Resources Safety website at **www.docep.wa.gov.au/ResourcesSafety**



Working hours **code of practice**

Following on from the State Government's 2003–04 review of extended working hours, the Minister for Employment Protection, John Bowler, launched the *Code of Practice: Working Hours* on 26 July 2006.

The code applies to all Western Australian workplaces covered by either the *Occupational Safety and Health Act 1984* or the *Mines Safety and Inspection Act 1994*.

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

It addresses fatigue and impaired performance and other safety and health risks, such as exposure to hazardous substances, that may arise from some working hours arrangements. The code emphasises conducting the risk management

process and developing industry and workplace-specific control measures.

The 2006 Mines Safety Roadshow program includes an information session on the code to discuss relevant issues, facilitated by the WorkSafe Western Australia Commissioner, Nina Lyhne, and State Mining Engineer, Martin Knee.

The publication is available online at Resources Safety's website.

About **EnergySafety**

This article is the second in the series about other divisions in the Department of Consumer and Employment Protection (DOCEP).

EnergySafety is responsible for the technical and safety regulation of all of the electrical industry and most of the gas industry in Western Australia. It administers the following Acts and regulations:

- *Energy Coordination Act 1994* (major parts)
 - Energy Coordination Designation of Inspectors) Regulations 1995
- *Electricity Act 1945* (most parts)
 - Electricity Regulations 1947
 - Electricity (Licensing) Regulations 1991
 - Electricity (Supply Standards and System Safety) Regulations 2001
- *Gas Standards Act 1972*
 - Gas Standards (Gasfitting and Consumer Gas Installations) 1999
 - Gas Standards (Gas Supply and System Safety) Regulations 2000
- *Fuel, Energy and Power Resources Act 1972*.



Photo courtesy of EnergySafety

The division provides wide-ranging energy-related policy advice and support to the Minister for Energy (who has portfolio responsibility for EnergySafety's statutory functions), the Minister for Employment Protection (who has administrative responsibility for DOCEP as a department and EnergySafety), the State Government and DOCEP's Director General.

Through memoranda of understanding, EnergySafety also

provides technical and safety advice and compliance and complaint investigation assistance to the Economic Regulation Authority and the Energy Ombudsman's Office.

As the State's technical and safety energy industry regulator, EnergySafety participates in important policy coordination and development with a number of State and national

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bodies covering electricity regulation, gas regulation, emergency management and technical standards.

EnergySafety regulates the energy industry in Western Australia to achieve:

- the safety of people (public, consumers, workers) and property in respect of electricity generation, transmission and distribution, gas distribution systems operating at up to 1.9 megaPascals (MPa) and gas production plants connected to such systems (safety regulation of gas transmission at 1.9 MPa or above and upstream gas production is administered by Resources Safety;
- the safety of all consumers' electrical and gas installations (including all types of equipment and appliances); and
- the efficient use of energy (e.g. the star rating scheme for electrical appliances).

EnergySafety's functions include:

- licensing electrical workers, electrical contractors and gas fitters;
- enforcing prescribed technical standards for electrical installing and gasfitting work;
- appointing and overseeing all inspectors in the State, including those of network operators
- requiring network operators, gas pipeline licensees and LP Gas cylinder distributors to conduct consumer installation safety inspections in accordance with prescribed requirements and auditing this work to ensure compliance;
- conducting safety inspections of consumers' electrical installations not connected to utility networks (but excluding installations on mine sites, which are now the jurisdiction of Resources Safety) or are not supplied with LP Gas directly from a distributor; and

- investigating electrical and gas safety incidents (although incidents associated with electricity or gas utilities' supply systems, or their customers, are usually inspected first by the relevant inspectors).

EnergySafety also ensures the safety and acceptable performance of electricity transmission infrastructure and electricity and gas distribution infrastructure by auditing network operators' design standards and constructed networks for compliance with prescribed safety requirements, and monitoring the safe work practices of network operators' employees and contractors, including attendance to incidents.



Photo courtesy of EnergySafety

Guide to general duty of care

Resources Safety has published *General Duty of Care in Western Australian Mines — Guideline* to provide guidance on the 'general duty of care' provisions of the *Mines Safety and Inspection Act 1994*.

The Act sets objectives to promote and improve occupational safety and health for people who work in mines in Western Australia. It imposes a general duty of care to maintain safe and healthy workplaces at mines, protect persons at work from hazards and describes the conduct required of people responsible for safety and health.

The guideline, which is endorsed by the Mining Industry Advisory Committee (MIAC), should be used by anyone engaged in mining operations in Western Australia, as all parties have responsibilities

for health and safety at work. This includes:

- employers;
- employees;
- contractors and their employees;
- labour hire agents and workers; and
- people involved in the design, supply, installation and maintenance of plant.

The publication complements the Commission for Occupational Safety and Health's *Guidance Note — General Duty of Care in Western Australian Workplaces 2005* by providing information specifically related to the mining industry.

The aim of the mines safety legislation is to make each person who works at a mining operation in

Western Australia responsible for his or her own safety, and for the safety of others who would be affected by his or her actions or inaction. The Act outlines the obligations of each group, and provides penalties for any breach of those obligations. The focus is on the prevention of unsafe situations. There is no need for an injury to occur before enforcement action can be taken to have an unsafe situation fixed.

The Act provides a framework where the general duty of care is supported by consultation, cooperation, workplace standards and procedures to resolve issues. The general duty of care is the guiding principle for all other parts of the Act. The Act is supported by regulations that describe some of the requirements that apply to specific work situations. While the

CONTAM system update

Procedures have been revised to explain what is required from mining operators and exploration companies to meet their obligations for sampling, reporting and submitting results for Resources Safety's contaminant monitoring (CONTAM) system.

The CONTAM system uses a database to retrieve and record representative, personal exposure monitoring results randomly collected from mining and exploration activities in Western Australia. It is used to assess the efficiency of management programs aimed to control dust and other airborne contaminants, with the main objectives to:

- collect comparative exposure data for different occupation groups, locations, and industry sectors for analysis of emerging trends within the industry;

- identify exposure groups that contribute to long-term health effects in mining employees; and
- monitor statutory compliance in the maintenance of acceptable working environments.

The updated document describes how the system works and provides guidance on completing CONTAM forms. It details changes to the workforce survey, CONTAM registration and reporting processes.

Following the procedures will help to ensure the uniformity and reliability of data collected for the CONTAM database. It is recommended that all ventilation officers familiarise themselves with the new procedures.

The document is available online at www.docep.wa.gov.au/ResourcesSafety (go to the CONTAM section under mining) or contact



9222 3229 or ResourcesSafety@docep.wa.gov.au to receive a copy.

regulations must be complied with, the overriding responsibility is to comply with the general duties in the Act.

The principle of having a duty of care applies to all workers, including those who are self-employed, supervisors and managers, and to employers at all levels, including corporations. It is aimed at preventing anyone being killed, injured or contracting an illness because of work activities in the mining industry.

A person must take the amount of care a reasonable person would take. What is reasonable will vary according to the situation, but the following principles can be applied to determine whether a particular action is reasonable:

- the standard of care will rise with the seriousness of the injury or harm that could result;
- the greater the likelihood of injury, the greater the care that should be taken to avoid it; and
- the easier it is to avoid the injury, the more reasonable it is to expect that appropriate measures will be taken to ensure it does not happen.

The comprehensive guideline also contains appendices listing specific legislative provisions and relevant sections of the Act, legal definitions under the Act, and information on mine hazard control and hazard identification, risk assessment and risk control.

The publication is available online as a PDF file at www.docep.wa.gov.au/ResourcesSafety or as a booklet



upon request (ph. 9222 3229, email ResourcesSafety@docep.wa.gov.au). Copies will be mailed to mine and exploration managers on our database. Registrants for the 2006 Mines Safety Roadshow will receive a copy in their 'showbag'.

Alcoa recognised

at national safety awards

An innovation developed by workers at Alcoa's Willowdale mine almost took Australia's top occupational safety award at the recent 2006 BOC National Safety and Health Innovation Awards held in Perth.

The innovation allows maintenance workers to remove bolts while they remain standing in front of large earthmovers, rather than lying under the machine holding a heavy rattle gun.

Judges said the bolt redesign had potential for adoption throughout the Australian and global minerals industry.

Caterpillar scraper machines are used to remove topsoil from areas to be mined and distribute it to other areas being revegetated after mining. Maintenance workers have to remove

and replace the scrapers' cutting edges as often as seven times a year.

Presenting Alcoa with a Highly Commended certification, the Minerals Council of Australia's director of safety and health, Rob Rawson, said the redesign of the cutting edges and bolts on the Caterpillar scrapers meant workers could now replace the edges without the previous risk of strains and sprains and other ergonomic issues.

Problems associated with the previous process included lying on the back with arms partially extended for lengthy periods of time, the need to support a heavy impact tool also for long periods, strain and sprain injuries to arms, shoulders, neck and back, and the physical fatigue from working in these awkward conditions.

The solution was developed when a mobile equipment fitter worked with the cutting edge supplier to design an alternate edge that removed the person from beneath the machine.

Following a successful trial there are now plans to fit this new-style cutting edge to the remaining nine machines in Alcoa's mining operations scraper fleet.

Bill Knight, Alcoa WA mines manager, said the National Safety and Health Innovation Awards was a showcase of companies committed to industry safety and excellence.

To be highly commended, which places Alcoa in the top three safety innovations nationally, is a real credit to everyone involved in developing these equipment modifications, Mr Knight said.

He said the company strongly supported employees who put forward ideas for improvements.

As well as Alcoa World Alumina Australia, Argyle Diamond Mines and Worsley Alumina participated in the

2006 awards, which are now in their eighth year.

The awards seek to recognise and promote safety and health innovation in the resources sector, and foster innovative solutions to everyday safety and health issues.

The performance of the Western Australian companies in the awards was commended by the chief executive of the Chamber of Minerals and Energy (WA), Tim Shanahan.

'These companies have made a demonstrable commitment to making the workplace safer for their workers,' Mr Shanahan said.

'By participating in the National Safety and Health Innovation Awards, they are sharing their experiences and facilitating the spread of great ideas to improve safety and health outcomes for the entire industry,' he said.

The VAST project from Argyle Diamond Mines was acknowledged for its innovative implementation of technology to adapt existing work instructions and procedures into video format that clearly demonstrates the 'Argyle' standards of competence to existing and new employees.

The top safety award for the night went to Coal and Allied (Rio Tinto Coal Australia) in New South Wales for a device that releases high pressure grease from lubrication lines on coal mining draglines.

The grease pressure release gun or 'Stored Energy Assassin' is a simple handheld tool that detects stored energy in lubrication equipment. It was developed following an accident that resulted in a worker losing the sight in one eye after being struck by high pressure grease.

Further details of the 2006 BOC National Safety and Health Innovation Awards can be found at www.minerals.org.au/safety and www.mirmgate.com



Photo courtesy of Alcoa

Before



Photo courtesy of Alcoa

After

Working at height

Everyone should be aware that being suspended upright without moving for more than five minutes can lead to unconsciousness and possible death, according to a recent safety alert issued by the NSW Primary Industries Department.

Employees need to be trained in the fitting and adjustment of full body harnesses and ensure adequate provision is made for the rescue of a person whose fall is arrested, according to the alert.

The alert warns that prolonged suspension from fall arrest systems can cause orthostatic intolerance, or suspension trauma, which can quickly lead to death.

Suspension trauma results from a harness restricting blood flow from the legs, with the resulting pooling of blood in the legs reducing the return blood flow to the heart.

Consequently, the brain, kidneys and other organs are deprived of blood and oxygen, which can lead to a lack of consciousness, serious injury and then death — surprisingly, unconsciousness can occur in as little as five minutes.

Harnesses can become deadly whenever a person is suspended for duration in an upright posture and motionless with legs straight beneath the body. (If you faint when standing, the body falls to the horizontal position allowing the blood to flow back to the heart and to be pumped to the brain.)

Factors that aggravate the problem include:

- the pressure exerted by the safety harness straps on leg veins, compressing them and reducing blood flow to the heart leading to unconsciousness; and
- the harness keeping the worker in an upright position, regardless of consciousness, leading to death.

Rescue must be carried out very carefully or it can also cause death. Moving a person quickly into a horizontal position — a natural reaction — is likely to cause a large volume of deoxygenated blood to move to the heart if the person has been suspended for an extended period. The heart may be unable to cope with the abrupt increase in blood flow, causing cardiac arrest.

Signs and symptoms of an individual who is approaching unconsciousness include faintness, nausea, sweating, dizziness, paleness, unusually low heart rate and low blood pressure, 'greying' or loss of vision, breathlessness and increased heart rate.

Resources Safety has a Mine Safety Matters brochure on working at height, available from its website or by contacting 9222 3229 or ResourcesSafety@docep.wa.gov.au



Photo courtesy of Michael Lovitt

Recommendations

The safety alert recommends the following.

- People should always look to use methods where there is no suspension.
- If fall arrest devices are to be used, it is essential to ensure that anchorages, arrest devices and harnesses are fit-for-purpose and correctly attached, fitted and worn.
- If people have to use a harness then they should never be permitted to work unobserved.
- Time in suspension should be limited to less than five minutes.
- It is recommended that foothold straps or a 'relief step' be used.
- Harnesses should be selected for specific applications and must consider compliance, potential arrest injury and suspension trauma.
- Rope or cable tenders must ensure the harness user is conscious at all times.
- Tie-off lanyards should be anchored as high and as tight as work permits.
- All people should be trained that motionless suspension in an upright condition for more than five minutes can lead to unconsciousness and possible death.
- People should be made aware of the signs and symptoms of harness-induced death.
- If self rescue is not possible, or a rescue cannot be performed promptly, people should be trained to pump their legs frequently to activate the muscles and prevent the risk of venous pooling.
- Suspended persons should be rescued as quickly as possible.
- People are trained that moving rescued workers into a horizontal position too rapidly can also cause death.

Government assistance

for safety management

A State Government program is available to assist Western Australian small businesses with safety management, including contractors to the mining industry.

While the program does not include mine sites, it does provide assistance to small businesses who have their own depots and contract to mining from time to time.

Available statewide to businesses with fewer than 20 employees in high-risk industries, the ThinkSafe Small Business Assistance Program gives small businesses a three-hour session with a qualified occupational

safety and health professional free of charge.

It is an independent and confidential service, and does not report safety performance to WorkSafe. A simple safety action plan is formulated, tailored to each individual business.

Small business employs almost half the State's private sector workforce, and research has shown that many small businesses are uncertain about how to create and maintain a safe workplace, and may be tempted to take risks due to economic pressure.

Employment Protection Minister, John Bowler, said the injury rate

throughout the small business sector was high.

"We see this program as a positive step in assisting small business to reduce the risk of injuries. Based on these positive results, we should soon see considerable improvement in the safety record of the small business sector."

The ThinkSafe Small Business Assistance Program is jointly funded by WorkCover WA, and is delivered in partnership with industry.

For further information or to apply for assistance, telephone 1800 429 273 for an application form, or download a copy from www.worksafe.wa.gov.au

National safety program a success

A national occupational safety and health inspection program dealing with falls from height from heavy vehicles has been hailed as a great success.



WorkSafe undertook the Western Australian section of the program leading to safer workplaces for those involved in the heavy vehicle sector.

The program is part of a ten-year National Occupational Safety and Health Strategy, which has gained the commitment of Government Ministers from all States and Territories and aims to see Australian workplaces free from death, injury and disease.

Employment Protection Minister John Bowler said these national campaigns were positive for industry, providing a level playing field and a set of benchmarks across the country, so everyone in the industry knows what is expected of them and all others in their industry.

Four main sectors were targeted during this program — car carriers, tankers, dry bulk haulage and livestock transport — with all operators required to conform to the same national standard.

The aims of the program were to increase:

- industry awareness of the legislative requirements associated with protecting workers from falls from heavy vehicles; and
- the capacity of the industry to implement and maintain safe systems of work.

In the car carrier sector, 90 per cent of all new and 40 per cent of all used vehicles are now being transported by heavy vehicles fitted with fall arrest systems, or by containers from which the falls hazard has been eliminated.

'I congratulate the transport industry on its participation in the program, and for its positive response to the workplace safety and health issues that were highlighted by the program,' Mr Bowler said.

'This type of united effort is invaluable in the continuing effort to reduce work-related injury, illness and death.'

How WA mining

performed in 2004–05

Did you know that in 2004–05 more than 19,500 days were lost through occupational injuries on mines in Western Australia or, that in the same period, 51,207 mine workers put in more than 100 million hours?

Those and other statistics are all in *Safety Performance in the Western Australian Mineral Industry – Accident and Injury Statistics 2004–05* published recently by Resources Safety to provide a snapshot of accidents within mining operations.

The comprehensive statistics are compiled by Resources Safety from accident and injury details reported monthly by mine managers. During the reporting period an average of almost 200 mines or groups of mines reported to Resources Safety. (Note that the data do not include activities associated with exploration.)

Notifications of injuries are obligatory under section 76(1) of the *Mines Safety and Inspection Act 1994* and

are entered into the AXTAT (injury statistics) database.

The 2004–05 statistics show a slight but continuing improvement in the overall safety performance of the Western Australian mining industry, with a small improvement in the lost time injury frequency rate (LTIFR), the number of lost time injuries per million hours worked.

There were 608 disabling injuries recorded for 2004–05, an increase of 112 on the 2003–04 figure of 496. The 51,207 employees in the mining industry, a rise of 12 per cent on the previous year, worked a total of 100.19 million hours.

Two mining industry employees lost their lives during the year, one underground at a gold mine and the other on the surface at an iron ore operation.

There were 425 lost time injuries (LTIs), 31 more than the previous year,

while the overall LTI duration rate improved by 10 per cent.

Unfortunately, serious injuries in the mining industry increased by 44 to total 316, with the overall serious injury frequency rate increasing by 7 per cent.

By sector, the LTIFR of the iron ore industry improved by 33 per cent, bauxite and alumina by 11 per cent, and gold by 9 per cent. However, the nickel sector deteriorated by 79 per cent.

Serious injuries

There were 316 serious injuries reported in the mineral industry during 2004–05, up from 272 the previous reporting year. Of these, 306 were in metalliferous mines and ten were in coal mines.

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Fatal accidents during 2004–05

Table 1 Fatal incidence rate by mineral mined 2000–01 to 2004–05

Category		Fatalities per thousand employees
Mineral	Dimension stone	3.64
	Base metals	0.19
	Diamonds	0.17
	Nickel	0.13
	Iron ore	0.11
	Gold	0.08
Underground		0.19
Surface		0.07

There were two fatal accidents in the Western Australian mineral industry during 2004–05:

- A prospector died on a small gold mine after falling 12.5m down a mine shaft. He had been travelling up the shaft on top of a full kibble and had just reached the surface when the rear guy rope of the headframe detached from its anchor point. This caused the headframe to detach and resulted in the fall.
- The driver of a road train engaged in transporting iron ore was fatally injured when his empty road train was struck by the third (rear) trailer of a loaded road train travelling in the opposite direction. The driver of the loaded vehicle lost control of the trailer, which overturned and was dragged into the path of the deceased's vehicle.

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Over the past five years the underground mining serious injury incidence rate was almost twice the serious injury incidence rate at surface operations, with diamonds and coal having the highest five-year average and salt the lowest.

The serious injury frequency rate decreased for underground metalliferous operations but increased on the surface and for the coal sector, resulting in a seven per cent deterioration overall during 2004–05.

Underground serious injuries to legs accounted for a quarter of injuries, followed by back (23%) and hand (21%). Of the leg injuries, 92 per cent were to knees and ankles.

Consistent with the high proportion of knee, ankle and back injuries, sprain or strain represented the highest proportion by nature of injury (51%), followed by fracture (11%), then dislocation and laceration (both 8%).

The majority of serious injuries underground were in production and development areas (53%), followed by



access and haulage ways (26%) and workshops (9%).

The most common accident types associated with serious injuries underground were over-exertion or strenuous movements (30%), followed by stepping (11%) and then caught by or between moving objects, caught by operating machine, fall from height, and slip or trip (all 8%).

On the surface, injuries to backs accounted for the largest proportion of serious injuries (22%) with arm (21%) and leg (19%). Of the arm injuries, 70 per cent were to shoulders and wrists, and 67 per cent of leg injuries were to knees and ankles.

Sprain or strain were the highest by nature of injury (44%), followed by fracture (13%) and laceration (8%).

Most serious surface injuries were in treatment plants (39%), followed by open pits (26%) and workshops (12%), with the most common accident types being over-exertion or strenuous movements (30%), slip or trip (10%), and vehicle or mobile equipment jolting and jarring and struck by object (both 8%).

Lost time injuries

The number of days lost from injuries in 2004–05 (8,247), recurrences of injuries prior to 2004–05 and in that year (1,240) and injuries carried over from previous years (10,052) totalled 19,539 days lost through occupational injuries on mines in Western Australia.

During 2004–05 there were 425 LTIs in the State's mining industry, 410 in metalliferous mines and 15 in coal mines. Ninety-six people who were still off work from injuries received prior to July 2004 lost 10,052 work days in 2004–05.

Fatal incidence by mineral

The fatal incidence rate, excluding exploration, by mineral mined from 2000–01 to 2004–05 shows an underground rate almost three times higher than the fatal accident rate for surface operations.

This is reflected in the gold, nickel and base metal sectors where most of the State's underground mining occurs.

Over the past five years there have been 19 fatalities in the mining industry, with four underground and 15 at surface operations. Each underground fatal accident was of a different type.

The most common type of surface fatal accident was vehicle or mobile equipment roll over, which resulted in four fatalities, followed by vehicle or mobile equipment collision and caught by or between operating machine, which resulted in two fatalities each.

Analysis of injuries

The comprehensive report also has statistics on injuries by commodity, many graphs and a thorough analysis of types of injuries.

Resources Safety, which collates the statistics, continues to regulate the mining industry by statutory inspections, safety management system and high impact function audits, playing an important role in providing education, training support and information to industry.

Safety meetings, presentations to mine site employees, and briefings to industry safety and health representatives complemented the inspection activities.

Resources Safety is also participating in and assisting with the development of the National Mine Safety Framework, an initiative of the Ministerial Council on Mineral and Petroleum Resources.

Go to www.docep.wa.gov.au/ResourcesSafety to access the comprehensive 36-page document online as a PDF file.

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

NOTE: Injuries that occurred in journey accidents travelling to and from work have not been included in calculations of incidence, frequency or duration rates.

2006 Surface Mine Competition



Against the backdrop of the Beaconsfield disaster, the significance of this year's 17th Annual Chamber of Minerals and Energy of Western Australia (CME) Surface Mine Emergency Response Competition was never clearer — trained mine rescuers save lives.

The competitive spirit this year was highlighted at the event held in Kalgoorlie from 5–7 May, with only half a point from a possible 1,000 separating first from second, and less than 20 points separating the top four teams.

The competition, organised by the CME and run by the dedicated Eastern Regional Council Mine Rescue Committee, is the largest held in the southern hemisphere.

Nicole Roocke, CME's Safety and Health Executive Officer, said challenging mine emergency response teams in events such as this provided an important opportunity for them to test their skills and equipment.

'Requiring teams to respond to an unknown realistic situation, within a set timeframe, while being assessed by others, helps to evaluate their knowledge and competencies. The feedback given by the adjudicators ensures that the event is also a training and development opportunity,' Ms Roocke said.

'It is essential that mining operations are proactive in managing health and safety. However, in the event of an incident it is critical that the operation is prepared for the emergency and is able to respond in a planned and coordinated manner.'

While the number of emergency response and rescue competitions in Australia has steadily increased in recent years in New South Wales, Victoria, Queensland and the Northern Territory, the Kalgoorlie event takes top billing.

For the third year in a row, the competition was held in the historic grounds of the Australian Prospectors and Miners Hall of Fame, which also 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 Open Day on Sunday attracted thousands of visitors, who watched teams compete in real-life scenarios including fire fighting, vehicle extrication, hazardous chemicals, rope rescue, confined space rescue, first aid and team skills.

The confined space rescue was a new challenge in this year's event, and was won by Placer Dome Kalgoorlie, while teams in the hazardous chemicals exercise faced an unconscious casualty with a broken arm and overcome by fumes.

The regular competitions, which have been held in the Goldfields since 1911, are essential in keeping teams in peak mental and physical condition. The scenarios are as close as possible to the real thing — the make-up of the 'injured' added a further touch of realism.

Sixteen teams from Western Australian gold, nickel and iron ore operations competed, including first-timers Agnew and Murrin Murrin.

The dedication and commitment of the teams were apparent as they used their skills, usually acquired in their own time, to react to the emergency situations presented over the weekend.

The weekend culminated at the presentation evening, which attracted more than 400 people, including local dignitaries and guest speaker Jimmy Wilson, president and chief operating officer of BHP Billiton Nickel West, sponsors of the evening.

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.

'The success of the weekend relies very much on the planning and work undertaken by the CME Eastern Regional Council Mines Rescue Committee. Events such as this one highlight how the industry is working together to ensure emergency preparedness within the region,' CME's Nicole Roocke said.

'Holding the event in conjunction with an Open Day at the Australian Prospectors and Miners Hall of Fame provided an excellent opportunity for the general public to see the dedication and professionalism of the mine rescue teams in action.

'The commitment of individuals who volunteer to be in the emergency response teams and the support provided by their organisations needs to be recognised. Without this, events such as the CME Eastern Regional Council Mines Rescue Competitions would not occur.'

2006 Surface Mine Emergency Response Competition

Seen at the competition



Competition photos by Peter Lewis



Photo courtesy of Blinco Photography



Photo courtesy of Blinco Photography



Photo courtesy of Blinco Photography

2006 Surface Mine Emergency Response Competition



Bottom of page 16, left to right: BHP Billiton Iron Ore Newman, Barrick Gold Plutonic and Placer Dome Kalgoorlie

Results

The Chamber of Minerals and Energy of Western Australia (CME) has congratulated the outstanding achievement and professionalism of the 16 teams who competed in the Surface Mine Emergency Response Competition held in Kalgoorlie in May.

Competition award winners included the top three teams:

- BHP Billiton Iron Ore Newman
- Barrick Gold Plutonic
- Placer Dome Kalgoorlie

with other awards going to:

- Newmont Jundee (*fire fighting*)
- Goldfields Australia St Ives (*first aid*)
- BHP Billiton Leinster Operations (*vehicle extrication*)
- South Kal Mines Harmony Gold (*hazardous chemicals*)
- BHP Billiton Iron Ore Newman (*rope rescue, theory and overall breathing apparatus skills*)
- Placer Dome Kalgoorlie (*confined space rescue*)
- Newmont Jundee (*team skills*)
- Barrick Gold Plutonic (*team safety*)
- Vic Marwick from BHP Billiton Iron Ore Newman (*individual theory*)
- Cindy Lewis from Newmont Jundee (*best captain*)
- Tim Campbell from LionOre Black Swan (*best coordinator*)
- Kevin Broadbent (*Harry Steinhauser Award*)
- Goldfields Australia St Ives (*best new team*)

Cindy Lewis is the first female to win the Best Captain Award at the surface competition.

Kevin Broadbent, emergency service coordinator at BHP Billiton Leinster, was awarded the Harry Steinhauser Award in recognition of his long and distinguished contribution to mines rescue in the North Eastern Goldfields.

The guest of honour at the awards was the president and chief operating officer of BHP Billiton Nickel West, Jimmy Wilson.

Mark Fisher, CME Eastern Regional Council Deputy Chairman, said the competition was a timely demonstration of the resources sector's commitment to the safety of its people.

Resources Safety plays part

Once again Resources Safety has been part of the success of the annual Surface Mine Emergency Response Competition held in Kalgoorlie in May.

Kalgoorlie District Inspector and emergency response competition stalwart Peter O'Loughlin played a major part as overall chief adjudicator, while Terry Siefken, Special Inspector of Mines, was an adjudicator in the new emergency coordinator's event.

Peter works in a three-person team to coordinate some 112 competitors, 60 adjudicators and 20 assistants, including 'patients'.

He has been involved in such competitions for the past 17 years,



Jim Boucaut (Senior Inspector of Mines), Brian Bradley (Director General, DOCEP) and Peter O'Loughlin (District Inspector)

after joining the KMA team (now KCGM, who mine the Kalgoorlie Superpit) as part of the graduate training program for mining engineers in 1989, competing that year. Following involvement as a team member, captain, site coordinator, event manager and organising committee chairman, Peter has been chief adjudicator for the past five years.

'The competition this year seemed more relevant because of the Beaconsfield rescue. The scenarios are very challenging and as close as possible to the real thing,' Peter said.

'These competitions provide opportunities for team members to bond, and the training in the weeks leading up to the competition and the weekend itself are like six months of training, with competitors learning from every event experience.'

Peter said many of the participants had been involved in life-saving rescues during their time as mine rescue volunteers, but hoped they would never be called on to use their skills in a real situation.

'However, it is comforting to know that we have competent and experienced employees on mine sites readily available should an accident occur,' he said.

This year two new events were introduced to the competition, covering confined space entry and emergency coordinators.

'It was recognised that the breathing apparatus event needed to be refreshed, and also confined space entry was an important facet of the mining industry that was specialised and relevant for mine rescue teams to be competent in,' Peter said.

He said the new event was designed to pick up on the breathing apparatus skills required in an atmosphere that may be toxic or oxygen deficient.

The emergency coordinator's event was introduced to test the mine site coordinator's skills when faced with a major on-the-ground emergency situation. It included an assessment of incident activation, action planning, priority setting, resource management and conducting a briefing.

Carmen takes challenge

as first female chief adjudicator in her stride

Carmen Ter Rahe, an occupational health and safety coordinator for Goldfields Mine Management, is the first female appointed as a chief adjudicator at the Surface Mine Emergency Response Competition. *MineSafe's* Peter Lewis spoke to Carmen about mine safety and her role in the annual event.

Question: As a chief adjudicator at this year's event, how did you rate the quality of the competition?

Answer: The quality of the competitions held here in WA, regardless of being surface or underground, is always of a high standard. This high standard not only relates to the teams competing but also the event managers, adjudicators, casualties and the scenarios themselves. This year's surface competition was no exception. In fact it has come back to me on the good old grapevine that the teams, and all those involved, rate this competition as the most organised

and effectively run competition they have been involved with. For me and my fellow organisers this is a terrific feeling and an excellent achievement for the Mine Rescue Committee.



Carmen Ter Rahe

Q: Could you outline some of the scenarios?

2006 Surface Mine Emergency Response Competition

A: The scenarios this year set a new benchmark. The time and effort event managers put into organising their scenarios and adjudication teams behind the scenes really needs to be applauded. Take the fire scenario for example, Daniel Brooks from Placer Dome and his team had a time frame of three weeks to build their scenario from scratch and they did a fantastic job. The logistics of this scenario were incredible when you consider the buildings they used and the fuel sources to actually run the fire, along with the involvement from FESA in assisting the guys with a tender and pump operator for the duration of the weekend. The scenario itself also offered a different challenge to previous years as teams were required to save a critical set of disks to a mining operation, along with a patient.

I also have to mention the first aid scenario. An explosion was simulated in a gold room and five patients presented with burns ranging from minor to severe; one poor guy even has his eyes melted shut and another with his stomach hanging out, all simulated of course! The makeup was extremely realistic thanks to the event manager, Sue Steele from Albercam, who is an old hat at these competitions and Belinda Butler from BGC. It was so realistic that we were told we should have probably put an MA rating on the door to the viewer's area of the event. The adjudication and casualty team for this event was a mixed group representing a range of companies, and made up of mostly people experiencing their first-ever competition, which was even more fantastic when first aid won best event for the competition.

Teams Skills offered a variety of challenges to the competing teams, which kept them on their toes, as did Vehicle Extrication, Confined Space and Rope Rescue. Realism and potential are two crucial ingredients in formulating any scenario, and this year's HazChem event was a great example of that. The scene was a truck misjudging a bend in the road with drums become dislodged and causing a mixing of the chemicals

on board. This blending of chemicals gave rise to a noxious gas, and the teams had to decontaminate casualties and make the area safe by neutralising those chemicals.

Q: Can you tell us a bit about the new scenario at this year's event — the confined space rescue?

A: The confined space rescue event was set up purposely for emergency response personnel to have exposure in training for a 'real to life' confined space rescue scenario. The teams were required to rescue someone who had come into difficulty when working in a confined space area. We know that, with a lot of mines having their own mills and processing plants, the potential for this type of scenario is quite real for some sites.

The teams were required to undertake a task where three workers remained unaccounted for. They had to ascertain the source of the incident, retrieve the missing personnel and make the area safe. In doing so, teams using breathing apparatus entered a vessel containing simulated sulphuric acid mist. They had to use their own training procedures to ensure they upheld the health and safety of all personnel and prevented further exposure to risks and hazards associated with the confined space area.

This event was managed and adjudicated primarily by the emergency response training facilitators from Riklan Emergency Management Services. They are a devoted bunch of guys who performed a brilliant job with this event in its inaugural year. I have no doubt this event will be back bigger and better next year.

Q: While the competition was being held the events of the Beaconsfield disaster were still unfolding. What effect did this have on the minds of those involved in the event?

A: The teams competing at the competition were there for a reason and are total professionals. Keep in mind some of the teams that competed have gone through their

own 'real' mine rescue situations on their sites. They have lost close friends and colleagues to mining tragedies, and know the full impact an event like this can have. The guys and girls in mine rescue teams do this job because of one thing and that's their dedication to providing a safe work place and emergency support to their own and mutual mine sites.

I would be lying if I said members were not constantly asking for updates or listening on the radio at any chance they got. It's been an event not only a nation has stood still for but the mine rescue fraternity throughout Australia has watched with bated breath. It would have been bloody awesome if they had of been out over the weekend of the competition but when you've been in this game for a while you know these things take time and actions need to be precise. Whilst everyone was hoping that both Brant and Todd would get out soon, unfortunately, one life had already been lost, that of Larry Knight, which made this rescue even more delicate, and it had to be done with extreme precaution and with high regards to safety.

I'm originally from Tasmania and have worked in the mines over there. I, along with others at the competition, knew people who were part of the rescue in Beaconsfield, and I have to say they were also constantly on our minds and in our prayers as well.

Q: What are the benefits of this type of competition to mining safety?

A: Mining safety greatly benefits from these types of events. Sure there is no comparison to having dealt with a 'real' mine rescue situation, however, the competitions give the mine rescue teams the opportunity to experience and be exposed to some of the pressures they might encounter at 'real' situations. This is conducted under a controlled environment and they receive the best possible profession debriefs from leaders in

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2006 Surface Mine Emergency Response Competition

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the emergency response field. All of us in the safety game hope that the expertise of these teams never has to come into play at the mine sites we work at but, if they do, we want to know that we have the best people at hand to do the job. Safety in mining is paramount.

Evidently today most companies have woken up and given support to the improved safety and mine rescue initiatives available to the industry. Although Western Australia is leading the other States, we still have a long way to go.

Q: What is the biggest challenge for a chief adjudicator in this type of competition?

A: We work with a great team on the Mine Rescue Committee — there is no doubt about that — but I would like to see more people who sit on the committee get involved. Everyone in the safety and emergency response sections of the mining industry is busy, but I would personally like to see more people step up to the challenge of event managing, adjudicating or being more supportive in a logistical sense.

To me, as a part of the Mine Rescue Committee, competitions today are

not just about competing for trophies. It's about the team work involved and the effort of getting to that point in the first instance. There is no doubt it takes time and commitment but it has been proved that we can reach great heights and we all know more hands make light work.

Q: You are now the first female chief adjudicator of the competition – what is your next challenge?

A: Having competed myself at the competitions, then adjudicated, then managed events and now as a chief adjudicator, that's a very good question. I have enjoyed immensely sitting in this role and the support of my fellow chief adjudicators Peter O'Loughlin and James Donnelly has been tremendous. I've been asked to adjudicate at the competition in Cobar, New South Wales, in July, but ask me again after I have a go at chief adjudicating at the underground competition here in WA in November!

Q: Can you tell me a bit about your full time job role?

A: I am an OH&S Coordinator for Goldfields Mine Management as part of one of the best management teams I have worked with. I look after the OH&S of two underground nickel mines, primarily where the ore is mined by air leg so this in itself

offers me some wondrous OH&S challenges. Along with this I am also responsible for day-to-day running of the injury management system and the management of emergency response and our mine rescue team. I would have to say by far that Goldfields Mine Management is the best company I have ever worked for; the employees are a wonderful group of people to work alongside and the management team is very supportive.

Q: You've mentioned that there are a lot more women within the mines rescue fraternity now – would you encourage more women to become involved in the industry?

A: Most definitely I would encourage more women to become involved in this industry. (It helps to keep the guys in line!) You see at least one woman if not two in most teams, which some years ago was unheard of and in some States still is. It has taken a while but now I think women are actually showing a great force within the mining industry and especially the mine rescue fraternity that was once ranked solely by men. Cindy Lewis from Newmont Jundee and Amanda Giles, who at the time was with MPI, have proven this in being the first females to take out the best captain awards at surface and underground competitions, respectively.

Safety alert on braking standards

An investigation of a fatality at a New South Wales quarry found that compliance with recognised braking standards does not necessarily mean a truck is safe to operate under all grades of a mining operation.

The text of the safety alert reporting the outcomes of the investigation is reproduced in its entirety here with permission from the NSW Department of Primary Industries. The original document (Mine Safety

Report no. SA06-13), including photographs, is available at www.minerals.nsw.gov.au/safety/alerts

The implication for mining operations in Western Australia is that compliance with AS, ISO or SAEJ standards does not automatically mean compliance with Section 9 of the Mines Safety and Inspection Act 1994, covering duties of employers because of variations in operating parameters.

NSW Department of Primary Industries Safety Alert:

Braking standards for trucks may not be fit for purpose

Incident

A truck driver was fatally injured at a quarry when the truck he was driving failed to negotiate a corner and rolled down an embankment.

Circumstances

The truck was loaded and descending the haul road when the incident occurred. The haul road was an average slope of 21% (1:4.7) with peaks at almost 25% (1:4).

This Safety Alert is a follow-up to SA05-10 Fatal Truck Accident at Quarry.

Investigation

The investigation found that compliance with recognised braking standards does *not* automatically mean the truck is safe to operate on all grades of a mining operation.

The following recognised standards appear to be fit for purpose on grades of up to 10% (1:10) only.

- AS 2958.1:1995 *Earth-moving machinery – Safety, Part 1: Wheeled machines – Brakes*
- ISO 3450:1996 *Earth-moving machinery – Braking systems of rubber-tyred machines – Systems and performance requirements and test procedures*
- SAEJ1473 *Brake performance – Rubber-tyred earthmoving machines*

NOTE: Compliance with these standards does not automatically mean compliance with the NSW Occupational Health and Safety Act 2000 or Duty of Care

Section 8(1)(b) of the NSW Occupational Health and Safety Act 2000 states:

(1) Employees

An employer must ensure the health, safety and welfare at work of all the employees of the employer

That duty extends (without limitation) to the following:

- (b) *Ensuring that any plant or substance provided for use by the employees at work is safe and without risks to health when properly used.*

Some problems which the investigation identified with the above standards include:

1. The formula for stopping distances for rigid-framed and articulated steer dumpers with gross mass over 32,000 kg is not clearly defined in

the standards. The calculations for stopping distances only allow for testing on slopes from 8% (1:12) to 10% (1:10) (which is common industry practice for mining industry haul roads). The standards do not adequately address the use of machines on inclines greater than this. A rollaway condition could occur at grades in the order of 13.5% (1:7.4) for secondary (emergency) brake performance, if the truck's braking system was designed to the minimum requirements of the standards.

2. The formula for stopping distances for lighter trucks does not adequately address the issue of travelling on grades. A rollaway condition could occur at grades in the order of 11.5% (1:8.7) for secondary brake performance, if the truck's braking system was designed to the minimum requirements of the standards.
3. Criteria for stored energy (pressurised) braking systems may allow reservoirs of insufficient capacity to be utilised upon failure of a single component in the braking system.
4. Independence of service and secondary braking systems, particularly pressurised brakes, may not be adequately achieved.
5. Issues with alarm levels and automatic application of brakes for pressurised systems.

Recommendations

To meet occupational health and safety obligations it is expected that all mobile equipment can ascend, descend, stop and hold stationary on all grades on which they traverse with consideration to:

- The gross vehicle mass (GVM).
- The operating environment.
- The failure modes of the truck.

As a minimum, brakes should be designed and tested in accordance with the recognised standards. Where equipment is required to operate on grades steeper than 10% the following additional criteria should be considered:

1. The *service braking system* is able to stop and hold the mobile equipment stationary, on the grade being traversed, in the shortest practicable time upon failure of the retarder.

This should be achieved with:

- A net deceleration of not less than 0.6 m/s² (6%g) for stopping on the decline.

For example, to traverse a 20% (1:5) grade the service brakes need to be capable of sustaining an average deceleration of approximately 2.6 m/s² (26%g) over the stopping period (2.0 m/s² to overcome grade gravitational energy and 0.6 m/s² for net deceleration).

- An average deceleration of no less than 1.85 m/s² (18.5%g) for overall service brake performance.

2. The *secondary braking system* is able to stop and hold the mobile equipment stationary, on the grade being traversed, in the shortest practicable time upon failure of the retarder or failure of any component of the service braking system. This should be achieved with:

- A net deceleration of not less than 0.3 m/s² (3%g) for stopping, on the decline being traversed.

For example, to traverse a 20% grade means the secondary brakes need to be capable of sustaining an average deceleration of approximately 2.3 m/s² over the stopping period. (2.0 m/s² to overcome grade gravitational energy and 0.3 m/s² for net deceleration).

- An average deceleration of no less than 1.3 m/s² (13%g) for overall secondary brake performance.

3. Brake testing and analysis should simultaneously consider maximum loads, speed and grades; energy absorption requirements; heat fade for the grades being traversed; simulated

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component failure and low system pressures.

4. For pressurised systems, the secondary brake performance should also be able to be achieved after the following event occurs simultaneously:
 - A failure of a single common component of the braking system, and
 - Following five applications of the operator's treadle (foot) valve, and
 - The system pressure reaches the operator's alarm level.
5. At the point of or following automatic application of the brakes the mobile equipment is still able to stop and hold on the grade being traversed.
6. The integrity of the braking systems be assessed against AS 4024 or AS/ISO 62061 or AS/ISO 61508 or other equivalent standards and failure modes and effects analysis (FMEA) or other similar risk assessment techniques.

NOTE: Guidance is provided in MDG 1010 or Minerals Industry Safety and Health Risk Assessment Guideline for FMEA analysis.

All mobile equipment designers, manufacturers and suppliers should

review designs and documentation to ensure:

1. Equipment is safe to operate and is capable of ascending, descending, stopping and holding on all specified operating grades, loads and environments.
2. The above criteria are met for the specified operating conditions and appropriate testing carried out to confirm compliance.
3. Appropriate information is provided to mines stating the safe operating loads and grades for their equipment (refer MDG 15 Clause 2.7).

All mines should immediately:

1. Review their site haulage routes and identify all trucks travelling on grades in excess of 10%.
2. Where mobile equipment is operating on grades steeper than 10%, they should contact the equipment manufacturer and have them confirm in writing that the above criteria is met and the mobile equipment is safe to use on the specified grade under the specified conditions.
3. Educate operators:
 - That these grades are maximums, and in no way take into account variations in ground or haul road conditions that can affect travel speeds. Other factors such as visibility, traffic and weather may need to be considered.

- Of the correct gear, speed and use of retard to descend a grade.

4. Where information is not forthcoming by the equipment manufacturer then the mine should carry out their own examinations and tests to ensure the above criteria is met and the mobile equipment is safe to use on the specified grade.
5. Design haulage roads to grades of 10% or less wherever practicable.
6. Carry out periodic testing to confirm the in-service brake performance.

NOTE: Any testing by mines should be under the direct supervision of a competent and qualified mechanical engineer and/or the equipment manufacturer's representative.

This Safety Alert should be read in conjunction with the following Safety Alerts:

- SA05-10 Fatal Truck Accident at Quarry
- SA06-12 Maintenance of Safety Critical Systems

NOTE: Please ensure all relevant people in your organisation receive a copy of this Safety Alert, and are informed of its content and recommendations.

Rob Regan
Director

Mine Safety Operations Branch
NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Safer sand operations

Inspections of sand operations in Western Australia have revealed a wide variety of methods being employed by companies.

Some face heights have been observed that far exceed the reach of the loading equipment that is operating. This presents greater challenges and risks, as depicted in Figure 1. It is therefore timely to explain the requirements of

regulation 13.14 of the Mines Safety and Inspection Regulations 1995.

The regulation states that '...unless the face of a sandpit stands at an angle that approximates the natural angle of repose of sand the manager of the mine must determine the maximum height of a working face taking into the consideration the material mined, the method of mining

and the equipment used so that safe working conditions are maintained.'

For example, where the sand maintains a natural angle of repose and continually rills maintaining the same angle of repose, there are no restrictions on height. This might occur where dry sand is present (Figure 2).

However, where the sand face exceeds the angle of repose — such as in

moist sand, which stands up when dug — the height of the face has to be determined by the manager. The size of equipment is important due to the regulatory requirement to slope the face at the end of the day to prevent a slump of sand. This includes all the sand pit walls.

In Figure 1, the equipment used does not match the height of the face being mined and therefore it cannot slope the face at the end of each day. Where sand deposits are deep and thick, the area should be benched rather than mining it in one pass.

Figure 3 depicts a sand operation where the face height is matched to the size of the equipment, allowing the face to be mined at a lower level of risk and be sloped at the end of the day.

An example of a well-planned sand operation was observed in the Goldfields area. A bulldozer was used to push down and maintain the correct angle of repose on the working face and create a sufficient stockpile of sand for ongoing needs (Figure 4). Instead of sloping the working face at the end of the day,

the loader operator in this case would only have to slope the stockpile to prevent slumping. Note that operators using this method should not work close to the edge of unconsolidated slopes — use dozed material as a buffer in front of the dozer blade and keep the slope *below* the angle of repose.

Another requirement of good sand operation management is to mine the working face over as great a length as is practicable to ensure sand stability. The sand face should be worked back and forth along the face in as straight a line as possible (with the loader always loading straight into the working face) — that is, avoid continually digging in one area creating a pocket, partial tunnel or bullnose corner that can lead to an increased risk of instability and collapse.

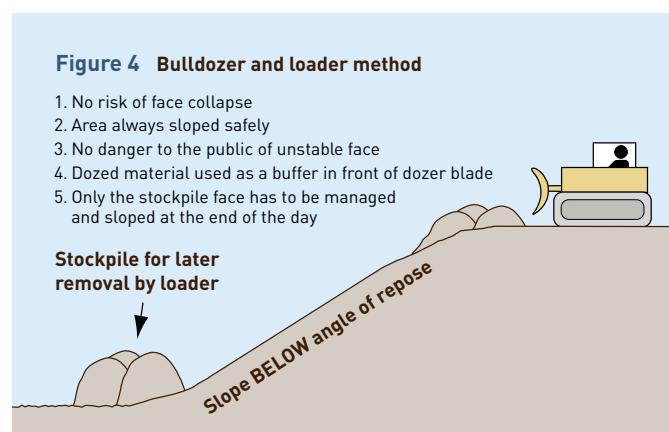
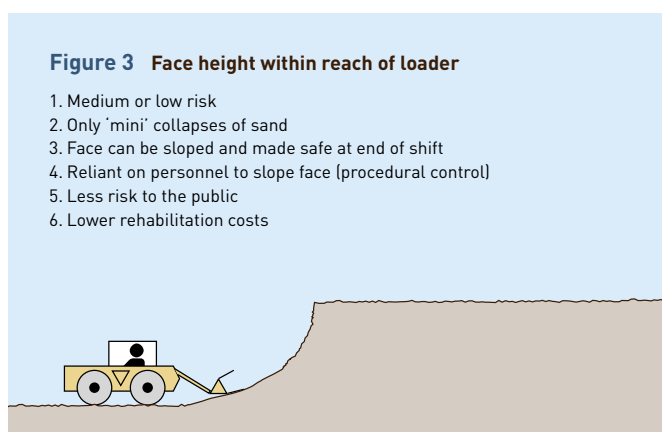
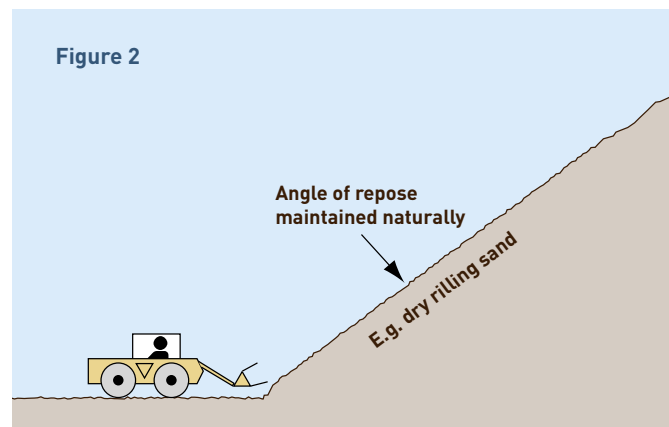
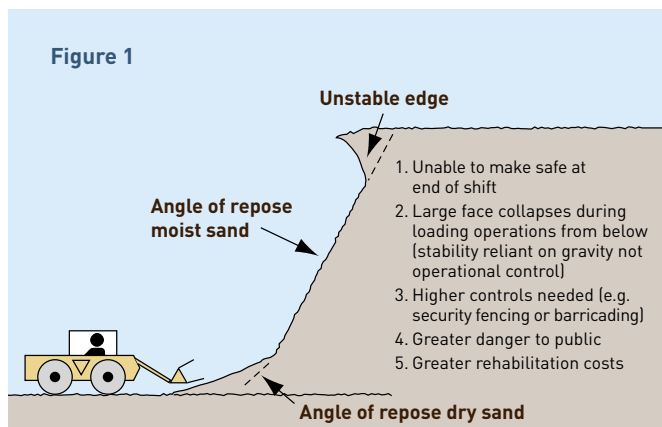
In New South Wales in 2002, a loader operator was buried by a collapse of sand when digging in one area. The sand face was about 15 metres high and the loader operator was chasing a pocket of better sand, creating a large hole in the face 10 metres wide by 10 metres deep. This created an

arc around the top of the digging face, which collapsed trapping the loader. The driver was able to escape but it took a few hours to dig the loader out.

The safety alert issued by the New South Wales authority made the following recommendations.

- All sand faces should be worked back and forth along the total length of the face in as straight a line as possible. Loaders should load straight into the face. A cavity should not be made into a face.
- Knock down the face at the end of the day.
- Consider benching the face when it's height exceeds the reach of excavating equipment.
- Erect a fence or other barrier at the top of the face to stop people falling over a dangerous face.

Resources Safety recommends sand mining in accordance with the methods described in NSW Safety Alert No. SA02-11 (available at www.minerals.nsw.gov.au/safety/alerts).



New access road to Kalgoorlie Explosive Reserve

Kalgoorlie's residential streets will now be safer, following the construction of a new access road to the Kalgoorlie Explosives Reserve.

Employment Protection Minister John Bowler recently officially opened the new route, which will divert trucks



Ron Yuryerich (Mayor of the City of Kalgoorlie-Boulder) and John Bowler (Employment Protection Minister)

from the Piccadilly residential area.

'Safety fears by residents over trucks travelling on Piccadilly Street will be a thing of the past with this new access,' the Minister said.

'Considering three or four trucks travel to and from the explosives depot each hour, most of the concerns of residents will be resolved with the completion of this new access route.'

The construction of the new road cost more than \$300,000 and included the filling in of sewerage treatment ponds, road sealing and the relocation of security gates.

'The resources boom has emphasised the importance of such a facility and it is pleasing to see the Government working with the City of Kalgoorlie-

Boulder to minimise the effect on the community,' Mr Bowler said.

'The State Government recognises the need for safe storage and handling of explosives and has also provided funding for the upgrading of facilities at both the Kalgoorlie and Baldivis Explosives Reserves.

'I understand further upgrades are planned at the Kalgoorlie reserve to ensure even higher levels of security and safety.'

The historic explosives reserve, the largest in the State, was gazetted in March 1903, and has been in continual use ever since.

The Minister congratulated all involved in the joint Resources Safety and City of Kalgoorlie-Boulder project.

Call for increased security when storing explosives

Two explosive magazines built to Australian Standards at a quarry site in southern New South Wales were recently broken into, prompting a warning from the State authority and a police investigation.

Oxyacetylene cutting equipment was used to break into the door of one magazine and the locking mechanism of another where a significant amount of explosives, detonators and detonating cord were stolen.



Ammonium nitrate storage

Stock changes were able to be verified as log books to account for the explosives and detonators were kept in the magazines, enabling police to determine the exact amount stolen.

In view of the use of an 'oxy-cutter', industry is advised to review site security plans to ensure adequate security arrangements are in place to minimise the risk of unauthorised people breaking into magazines at any time.

Recommendations

Consider:

- keeping separate copies of details within log books secure and separate to the magazines (so stock records cannot be stolen);
- carrying out regular checks of magazines by security staff day and night and at weekends;
- constructing magazines out of reinforced concrete and steel,

being guided by specifications for both materials within the Australian Standard AS 2187:1998, Part 1;

- installing appropriate movement sensitive alarms (rated to IP65) within magazines and ammonium nitrate storage facilities;
- using electronic locks to access explosive compounds and ammonium nitrate storage facilities
- locking cupboards containing exploders;
- ensuring magazine keys are numbered and a key register is utilised and kept in a secure place;
- ensuring copies of log book details are kept; and
- installing closed circuit television (CCTV) with movement sensors or with direct vision to a control room, with both having a means of storing a copy of any movement around magazines.

Safety and health representatives section

Ask an inspector



Doug Austin (right) talks with Chris Allen, a safety and health representative at Harmony Gold's Cue operation

Perth-based District Mining Engineer Doug Austin has a wealth of experience in mine safety, having been with Resources Safety in its various guises for more than 25 years.

The Kalgoorlie born and educated inspector and mining engineer is a graduate of the WA School of Mines, commencing his career in the town and Kambalda, before joining the then-Department of Mines as District Inspector of Mines in 1980.

Doug continued in the Kalgoorlie office until 1984, when he transferred to Perth.

In his current role, Doug's responsibilities include administering mines safety legislation, undertaking investigations of fatal and serious accidents, inquiring into complaints, and reviewing and assessing management safety systems and high hazard elements in the mining process.

He also liaises with employers and employees to provide and achieve high standards of safety, and

responds to requests for regulatory and technical information.

'One of the essential duties of a district inspector is to investigate what can be technically complex fatal accidents,' Doug said.

'These investigations can often take many months to complete and for a full and thorough report to be handed to the Coroner.'

He said that most mine sites these days had elected safety and health representatives and he made a concerted effort during mine visits to contact them.

'The cross-communication is invaluable to both parties. The representatives are a valuable source of information to an inspector, who is an infrequent and irregular visitor to the mine,' Doug said.

Training of new starters a priority for Doug

During the current unprecedented resources boom, promoting the importance of looking after new starters in the mining industry is paramount, according to Doug Austin.

'The resources boom has been extraordinary and many people have sought and obtained employment for the first time in the industry,' he said.

'Inspectors have taken many calls from individuals asking how they can get a job in the mining industry or saying that they would like to work at a mine as a truck driver.'

Doug said this influx has placed pressures on employers to turn 'raw recruits' into competent operators of mobile plant.

Regulation 4.13 of the Mines Safety and Inspection Regulations 1995 stipulates that every employee must

be given '...adequate instruction and training in safety procedures and systems of work and in the tasks required of the employee...', and be '... assessed before commencing work at the mine to ensure that the employee is competent to perform the tasks he or she will be assigned and to operate any plant and equipment the employee will be required to operate...'

'Records must also be kept of instruction, training and assessment and it is important that the training is formalised and structured,' Doug said.

Some pointers for the training of new recruits are listed below.

- The task skills need to be identified and taught to the trainee.
- The skills learnt by the trainee must be formally assessed by practical and theory tests before moving to the next stage.

- Records of written tests and practical competence assessments must be retained. The records must clearly identify the particular training and assessment undertaken, be signed and dated by the trainer, and countersigned by the trainee.
- The employer must ensure that the trainers are highly competent operators with the experience and aptitude to effectively train others. Some tuition of trainers in training methods is desirable.



Mining vehicle

warning lights exempted

The State Government has removed fines for the use of mining vehicles equipped with orange rooftop warning lights on gazetted roads.

Previously, orange warning lights were required to be removed when vehicles fitted with them were driven on roads.

Exemptions will now be granted to vehicles that drive on the roads with the flashing lights fitted but not in use, and police will focus only on vehicles with the lights in operation on gazetted roads.

A proposal to have the lights fitted with a cover highlighted serious safety concerns. This proposed compromise to fit covers could have resulted in serious occupational health and safety issues with larger vehicles, when employees needed to climb on to the roof of the vehicles to cover the lights.



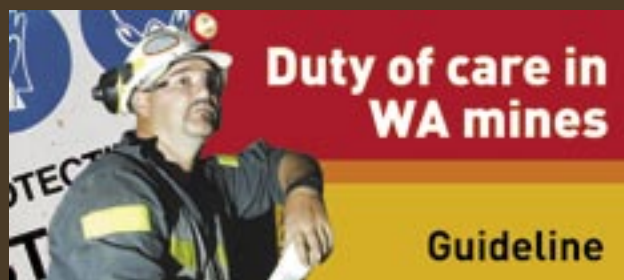
What's new on the web

The Resources Safety website receives over 6,000 hits per month and, since its revamp under a 'three clicks and you're there' strategy, the number of visitors has steadily increased over the past six months.

To find out what's new on the site, add www.docep.wa.gov.au/ResourcesSafety to your list of favourites and keep an eye on the billboards at the right-hand side

of the homepage. The billboards link directly to significant new material and are a quick guide to what's been added recently.

If you experience problems using the site or have any ideas to improve its navigability or content, please contact 9222 3229 or ResourcesSafety@docep.wa.gov.au – your input is welcome.



www.docep.wa.gov.au/ResourcesSafety



Safety bulletin

All bulletins and significant incident reports are available online at www.docep.wa.gov.au/ResourcesSafety in the mining section

Mines Safety Bulletin No. 77
Released 11 May 2006

Use of telehandlers

Background

A recent serious incident in New South Wales involving a telehandler has raised concerns over the use of these machines to lift freely suspended loads. Research by Work Cover NSW indicates:

- some telehandlers not designed to lift freely suspended loads are being used for this purpose; and
- telehandler stability is affected when operating on sloping ground with a freely suspended load.

This safety bulletin is based on the Work Cover NSW Safety Alert published in August 2005 and WorkSafe VIC Alert published in March 2006.

Expectations

Owners of telehandlers and those responsible for their use should have all applicable supplier's information for the machine, including the maximum operational slope and other limitations. They should ensure their machines have been designed to accommodate the required attachments, and are suitable for the tasks they are to perform and

the location they are intended to be used. Where intended to lift freely suspended loads, written confirmation that the machine complies with Australian Standard AS 1418.5 or an equivalent standard should be readily available on site.

Purpose

Employers and operators who use or intend to use telescopic handlers ('telehandlers') must be aware:

- that some telehandlers are not designed to lift freely suspended loads; and
- a location where the ground is rough, uneven or sloping can significantly affect the machine's stability when operating as a mobile crane.

Note: Telehandlers are also known as multi-purpose handlers, cranes, tool carriers and telescopic forklifts, and by a variety of proprietary names.

Resources Safety's position

Telehandlers used to lift freely suspended loads by a jib attachment or other means *must comply with Australian Standard AS 1418.5*. If an inadequately designed telehandler is observed being used as a mobile crane, or is likely to be so used, Resources Safety inspectors will take appropriate compliance action.

Technical information

A telehandler is a versatile type of mobile lifting plant incorporating a telescopic boom fitted with a lifting attachment. The usual means of lifting is by forks, but telehandlers

can be fitted with a variety of attachments for different types of loads. The range of attachments that can be used depends upon the design of the particular machine, and these often include a jib for lifting freely suspended loads.

Typically, telehandlers are used to travel with their load (pick-and-carry). When the load is supported on forks, it should be lowered as close to the ground as possible and the boom retracted during travel. However, when the load is freely suspended, it needs to be elevated to prevent it snagging on the ground or other obstacles. This, coupled with the fact that the load can swing and exert additional dynamic forces on the machine, may adversely affect the machine's stability. When operating on sloping ground, the potential for instability is increased as the load swings further out from the lifting point.

Stability ratio is critical

A telehandler designed and intended to be used as a mobile crane, to pick-and-carry a freely suspended load, must have a stability ratio not greater than 66% in this mode. This is the maximum allowable stability ratio specified in Australian Standard AS 1418.5, Cranes, hoists and winches Part 5: Mobile cranes.

Suppliers of telehandlers designed and tested in compliance with Australian Standard AS 1418.5 should be able to readily produce written confirmation of compliance. Such models are suitable as pick-and-carry mobile cranes.



Resources Safety publishes a range of material

Brochures



Posters



MineSafe magazine



Toolbox presentations



Guidance materials



Email: ResourcesSafety@docep.wa.gov.au

www.docep.wa.gov.au/ResourcesSafety



Public comment sought

Dangerous Goods Safety Legislation - Transport Regulation Changes

New regulations under the Dangerous Goods Safety Act 2004 introduce a system of approved emergency responders to improve the efficiency and competency of the emergency response for road and rail accidents involving dangerous goods.

An information sheet on the proposed changes is available for public comment.

The information sheet can be obtained:

- by phoning the Resources Safety Infoline on 1300 855 685 and recording your contact details; or
- from the Resources Safety website at www.docep.wa.gov.au/ResourcesSafety.

Comments must be submitted in writing to:

- Resources Safety
Department of Consumer and Employment Protection
Locked Bag 14, Cloisters Square WA 6850;
- fax (08) 9222 3525; or
- email ResourcesSafety@docep.wa.gov.au

All public comment must be received by 5 pm WST, Monday 31 July 2006.



Public comment sought

Dangerous Goods Safety Legislation - Fees and Charges

New regulations under the Dangerous Goods Safety Act 2004 introduce changes to the licensing regime relating to dangerous goods and major hazard facilities (MHFs). More stringent controls for security risk substances (SRS) will also be introduced.

An information sheet on the proposed changes is available for public comment.

The information sheet can be obtained:

- by phoning the Resources Safety Infoline on 1300 855 685 and recording your contact details; or
- from the Resources Safety website at www.docep.wa.gov.au/ResourcesSafety.

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- Resources Safety
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