Resources Safety matters

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Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**
Resources Safety

SAFETY&HEALTH
RESOURCES SECTOR AWARDS

CELEBRATING INDUSTRY INNOVATION AT AWARDS FOR EXCELLENCE

INTRODUCING THE NEW SAFETY REGULATION GROUP

CELEBRATING 70 YEARS OF SCIENCE IN HUMAN AND ORGANISATIONAL FACTORS

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WINDS OF CHANGE

As 2017 comes to an end we can see that the formation of the new Department of Mines, Industry Regulation and Safety is beginning to bear fruit.

By bringing together Resources Safety and WorkSafe WA into the new Safety Regulation Group, it is expected that significant synergies will be accomplished.

There are more commonalities than differences between Resources Safety and WorkSafe WA. Many skill sets can be utilised across all of the regulated industries, such as occupational hygiene, structural engineering and delivery of core training to inspectors.

The Safety Regulation Group has responsibilities for a broader range of industries and activities. These include occupational health and safety across all State-regulated industries and the regulatory functions of the former Labour Relations Division (except those regulated by the Commonwealth).

As we move into 2018, we can expect exciting opportunities to emerge that will enable the delivery of efficiencies and cost savings while providing an enhanced service to industry.

Simple examples include reducing the cost of inspector training through economies of scale, and the efficiencies gained by providing a single unified approach to the processes involving registered plant.

On a personal note, I will be retiring from my position at the Department on 31 December 2017 and wish you all a safe and prosperous 2018. Early in 2018, the Safety Regulation Group will be reorganised under the guidance of a Deputy Director General.

Simon Ridge
Executive Director Resources Safety
15 December 2017

From left: Executive Director Resources Safety, Simon Ridge; Minister for Mines and Petroleum, Honourable Bill Johnston MLA; Director General, David Smith; Director Mines Safety, Andrew Chaplyn

INTRODUCING THE NEW SAFETY REGULATION GROUP

On 28 April 2017, Premier Mark McGowan announced that 40 per cent of Government departments were to be amalgamated or abolished.

The reform is aimed at creating collaborative departments focused on whole-of-government objectives and delivering services in the most efficient way, including using new technology.

On 1 July 2017, the Department of Mines and Petroleum (DMP) and Department of Commerce (DoC) merged to form the new Department of Mines, Industry Regulation and Safety (DMIRS).

The new Department's mission is to support a safe, fair and responsible future for Western Australia.

As part of this reform, a new Safety Regulation Group has been established. The structure of this Group consolidates and refines the interim structure that has been operating since 1 July 2017 in the following areas.

- Mines Safety (ex-DMP)
- Dangerous Goods and Critical Risk Safety (ex-DMP)
- Industrial and Regional Industry Safety (ex-DoC)
- Service and Specialist Industry Safety (ex-DoC)
- Regulatory Support (consolidated ex-DMP and ex-DoC)
- Private Sector Labour Relations (ex-DoC)
- Public Sector Labour Relations (ex-DoC)

The purpose of the Safety Regulation Group is to provide regulatory and policy oversight of:

- workers' health and safety in the resources and general industries sectors
- the licensing regime and safety legislation for dangerous goods, including regulation of the State's major hazard facilities, and petroleum operations.

The Group is also responsible for the coordination, governance, and consistent management of public sector labour relations and parts of the State's private sector workforce.

It plays an important role in building and strengthening Western Australia's economy by ensuring the State's most significant asset – its workforce, operates in a healthy and safe environment where rights are protected.

ACHIEVEMENTS REPORT FOCUSING ON BETTER OUTCOMES FOR INDUSTRY

The latest Resources Safety annual achievements and performance report outlines the Division's key initiatives and programs implemented or active in 2016-17 to achieve the Towards 2020 vision of a safe and healthy resources sector.

Key initiatives and programs vary from educational seminars, guidance materials and the provision of specialist information to stakeholders to targeted compliance inspections and legislative enforcement.

The report summarises the divisional resources applied, regulatory outputs and achievements in support of the regulator's goals.

In a departure from previous annual reports, the focus is on outcomes as well as outputs, with the ultimate measures of success being reductions in the number and incidence rates of serious accidents and incidents in the Western Australian resources sector.

A case study of incidents involving hazardous manual tasks and musculoskeletal disorders shows how regulatory activities might be reflected in better industry outcomes.

Since 2010, funding to help maintain many safety regulatory services and acquire additional resources has been obtained through cost recovery from the relevant industry sectors. The financial statements for levy monies are detailed in the report.

The report is available to download at www.dmirs.wa.gov.au/ResourcesSafety

WORKING TOWARDS OUTCOMES

GOING DIGITAL @ DMIRS

RECENT ENHANCEMENTS TO THE SAFETY REGULATION SYSTEM (SRS)

Industry coding of injuries

Company administrators and representatives who submit Injury Report Forms (IRFs) are now required to code certain areas within a notification. This includes:

- occupation
- nature of injury
- part of body
- location
- type of accident
- activity
- breakdown agency
- agency of injury

To assist industry, the department has developed a suite of videos to guide users through the process, in conjunction with an index of injury coding. The aim is to produce more accurate data for analysis.

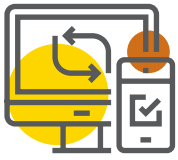
Health and hygiene

Following the implementation of the health and hygiene sampling module in May 2017, further functionality has been introduced to assist with the management of exceedances, including a declaration covering five key management strategies for excessive exposures to noise and atmospheric contaminants.

COMING SOON

Notification of the election of safety and health representatives (SHReps)

This functionality will allow sites to manage SHRep appointments within SRS. Other benefits include:



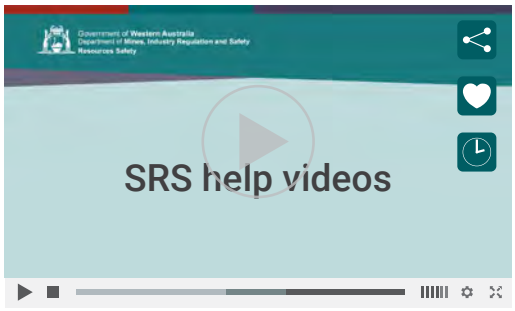
- SHReps being able to nominate preferred contact details
- automatic provision of information to newly appointed SHReps
- reminders for re-election and training to be managed through SRS

KEEP UP TO DATE

When new external user functionality is released, the Department provides support to industry including instructional videos and technical online guidance.

To receive updates on SRS releases, visit **www.dmirs.wa.gov.au/ResourcesSafety** to subscribe to the weekly news alert.

INDUSTRY SRS TRAINING VIDEOS NOW AVAILABLE



The current focus is to deliver system training via video available online. This is the most efficient and consistent method of delivering training. Videos for industry are published on the Vimeo website, and can also be accessed from SRS online help and the Department's website. Some training videos currently available to industry are listed below.

- System access
- Related communications
- Notification of appointments
- Site visit records
- Injury report coding
- Health and hygiene

DANGEROUS VEHICLE LICENCE APPLICATIONS ONLINE

Dangerous Goods Vehicle Licence applications can now be lodged online using the DMIRS Departmental Submissions portal.

Licence applications can be submitted online along with credit card payment and supporting documentation. Multiple attachments can be uploaded (up to 1 GB for each attachment).

The portal can also be used for amending licences and communicating with the Department about licences and applications.

The benefits to industry:

- easier access – the portal works on any mobile device and can be used anywhere with internet access
- faster lodgement – applications are received immediately by DMIRS, no postage delays or travel for lodgement in person
- improved service for regional and remote customers
- greater accuracy
- quicker resolution of deficiencies
- reduced licence issue turnaround time
- easier to complete writable online form

The online form simplifies DMIRS' business processes, resulting in greater efficiency, faster processing times and better record keeping.

LICENSING AND REGULATION

The Licensing and Regulation Branch's role is to provide support services internally to the Resources Safety Division and externally to mining, petroleum and dangerous goods operators and licence and permit holders.

Over the past six months, the Branch has been working on a number of initiatives aimed at improving services to our external customers.

- Lodging applications and notifications online: As part of the Department's move away from using paper-based forms, Dangerous Goods Vehicle Licence applications and Change of Address notifications can now be submitted online using our Departmental Submissions system. Fireworks Event Permit applications will be next.
- Releasing the DG Site Viewer: The planned release of the DG Site Viewer in early 2018 will significantly reduce red tape, making information about dangerous goods sites available online using a searchable system similar to Google Maps. It is hoped that this system will reduce the number of Freedom of Information requests – which are mainly due diligence checks for property transactions – by more than 300 per year, saving applicants both time and money. Applicants pay a $30 fee per request and typically wait up to a month for the information, which in almost a third of cases finds no licence.
- Supporting the rollout of other Safety Regulation System (SRS) modules: New SRS modules to be rolled out include the new Technical Submissions and Notification of Election of Safety and Health Representatives (SHReps) functionalities. The questions and other feedback we receive as these systems are deployed are analysed for opportunities for further streamlining and improvement.

Finally, it is worth mentioning the significant uptake of our SRS video training packages. These videos allow people to get training anytime, anywhere, and as many times as they need it. The sixteen videos that have been released so far have now had more than 1,600 views, and feedback has been overwhelmingly positive.

Philip Hine
Director Licensing and Regulation

DRIVING DELIVERY OF HIGH-QUALITY REGULATORY SERVICES

A comprehensive internal training framework is being developed for the safety regulator with the initial focus on mines safety to be followed by dangerous goods safety.

The training framework is being developed in consultation with an external training provider. It is mapped to national competencies and include structured lesson plans to ensure that inspectorate staff are provided with targeted, structured and integrated training over the course of their employment, and have the necessary skills and knowledge to deliver a consistently high levels of regulatory service.

DANGEROUS GOODS AND PETROLEUM SAFETY

With the festive season upon us, I am reminded that, while it may be a time for celebration, it can also be a time when isolation from loved ones adds to the everyday workplace stresses and pressures we all feel.

Our understanding of mental health and wellbeing has advanced significantly in recent years. Employee assistance and other such programs are indicative of employers' growing recognition of the impact mental health and wellbeing can have on the workforce. There is also a growing understanding of the individual roles we can play in checking whether our workmates are okay and, if they're not, directing them towards the range of support services that are available.

As a regulator, we routinely discuss human and organisational factors with operators, and include it as part of industry forums on site safety. When operators develop or update safety management systems, it is important to consider mental health and wellbeing within those factors.

A significant number of safety cases are coming up for review over the coming year, especially for major hazard facilities.

In making the case for safety, we have previously telegraphed to industry what we are considering in the review and our focus areas as regulators. As a reminder of the five-yearly reviews, we are committed to ensuring this process is consistent across the industries that we regulate.

Although we have previously communicated the focus areas and factors to consider, I have summarised these from previous presentations as a reminder in a later article in this edition of *Resources Safety Matters*.

Ross Stidolph
Director Dangerous Goods and Petroleum Safety and Chief Dangerous Goods Officer

Photo courtesy Chevron Australia

MINES SAFETY

NEW FACES

During 2017 the Mines Safety Branch has welcomed new staff to the inspector ranks. They are now well into their formational training programs, with some already appointed inspectors.

The new staff includes:

- Marie Belanger – Process Engineer (Perth)
- Amy Douglas-Martens – Mental Health and Wellbeing (Perth)
- Roley Fletcher – Process (Perth)
- Paul Foley – OSH (Perth)
- Morrie Goodz – Team Leader (Kalgoorlie)
- Narelle McMahon – Mining Technician (Kalgoorlie)
- Lindy Nield – OSH (Perth)
- Peter Nissen – OSH (Perth)
- Martin Ralph – Regional Inspector of Mines North (Perth)
- Andrew Stanbury – OSH (Perth)
- Stephen Stirling – Process (Perth)
- Nicole Tucker – Geotechnical Engineer (Perth)
- Tamara Warry-White – OSH (Kalgoorlie)
- Roy Zylstra – Electrical Engineer (Perth)

The biannual Inspectors Forum held in September was a chance for new staff to get to know each other. During this time, inspectors spent time discussing key safety issues, ensuring we keep up-to-date with industry developments and performance, sharing safety lessons learnt and focusing on priority areas in the *Towards 2020* strategy. It was also a chance for the Branch to show support for the 50th anniversary of Mental Health Week with the blue hi-vis shirts.

STATEWIDE TEAM

With the arrival of new specialists – and striving to have the right person, addressing the right issue, at the right time – the Branch recently reorganised inspectorate teams.

In addition to the geographical teams of Collie, Kalgoorlie, North (Pilbara and Kimberley) and Mid West, we have now established a Statewide team of specialists that can be used as a resource across Western Australia.

All mining operations should be aware of the team that looks after them, especially their District Inspector, in order to meet all reporting requirements. If unsure, the Safety Regulation System (SRS) can be used to make contact with the Department to confirm arrangements.

CONFERENCE OF CHIEF INSPECTORS OF MINES

October saw the chief inspectors of mines from across Australia, New Zealand and Papua New Guinea gather in Tasmania for two days of discussions. They also took the opportunity to visit mining operations on Tasmania's famous west coast, including MMG's Rosebery underground operations and Grange Resources' Savage River mine.

The main topics of discussion were an update of legislation in each jurisdiction towards adopting the model work health and safety legislation in the resources industry, and safety performance of the relevant state mining sectors. Other topics included the effects of airborne dust (including black lung and silicosis), competency of statutory positions and key leadership roles, sharing safety lessons learnt (particularly from recent fatalities), emergency response capacity of mines, safety management systems and risk management approaches.

Andrew Chaplyn
Director Mines Safety and State Mining Engineer

Mines safety inspectors showed support for the 50th anniversary of Mental Health Week with the blue hi-vis shirts

From left: Director General DMIRS, David Smith; Executive Director Resources Safety, Simon Ridge; Minister for Mines and Petroleum, Honourable Bill Johnston MLA; Acting Deputy Director General, Lex McCulloch; Director Mines Safety, Andrew Chaplyn

From left: GBF Group General Manager, Franko Roberts; General Manager Avoca Mining, Ron Ellis; Project Manager GBF Mining, Stephen Simpson; Regional Inspector of Mines, Graham James

2017 REGISTERED MANAGERS FORUM FOCUS ON WORKER SAFETY

More than 120 registered mine managers attended the Department of Mines, Industry Regulation and Safety's Registered Managers Forum in August.

The forum was opened by Minister for Mines and Petroleum, Bill Johnston, and provided an opportunity for mine managers and key decision makers to come together and focus on health and safety.

Mr Johnston said worker safety is a key priority for the State Government and the Department.

"It's important the State Government works with industry to help reduce serious accidents and incidents, and support positive cultural changes in the workplace," he said.

"By working together, we can improve the health and safety of workers in WA and achieve the ultimate goal of zero harm."

The one-day forum featured workshops and presentations, including one from international safety expert Deb Grubbe, who has served on a NASA advisory panel and is the former Vice-President of Group Safety for BP.

Ms Grubbe spoke about her experiences in process safety leadership and safety culture in the oil and gas, chemical, healthcare, construction and aerospace industries.

SHARING THE LEARNINGS ON CONTRACTOR MANAGEMENT

During the 2017 Registered Managers Forum, Alena Titterton (Health Safety Security and Environment partner at the law firm Clyde & Co) conducted a presentation on contractor management, safety management systems and positive investigation methodology. Throughout the presentation, event attendees participated in live polling via their smartphones and tablets, capturing their views on contract and safety management systems.

The report summarising the results of this live polling is available on the Department's website at **www.dmirs.wa.gov.au/ResourcesSafety**

CELEBRATING INDUSTRY INNOVATION AT AWARDS FOR EXCELLANCE

SAFETY&HEALTH
RESOURCES SECTOR AWARDS

Western Australia's resources sector showcased its commitment to innovation and new technologies at the Department of Mines, Industry Regulation and Safety Awards for Excellence ceremony in October.

DMIRS presented the Safety and Health Resources Sector Awards for the first time this year, with two of the three category winners focusing on the mental health and wellbeing of their workers.

- Iluka Resources won the Systems and People category by partnering with Winston, a steer from Dardanup. The partnership is an innovative approach to raising awareness of mental health issues within the workforce, resources industry and wider community.
- Fortescue Metals Group won the Safety Representatives category with the Safety Barometer, a means of understanding the impact of attitude and distraction on safety.
- Rio Tinto took out the Engineering category for its rail-mounted working at heights platform, which addresses falling from heights, one of the top risks in the resources sector.

Executive Director Resources Safety, Simon Ridge, who also sat on the judging panel, said the awards were an important part of sharing safety innovations in the sector.

"The safety and health of workers in the resources industry should always be our highest priority and it often starts with cultural change. These awards showcased some remarkable innovations in this critical area, and it is important these innovations are shared across the sector," Mr Ridge added.

Compliance Manager for Aglime of Australia, Tammy Baker gave a presentation on innovation technology to manage onsite inductions

> THE SAFETY AND HEALTH OF WORKERS IN THE RESOURCES INDUSTRY SHOULD ALWAYS BE OUR HIGHEST PRIORITY AND IT OFTEN STARTS WITH CULTURAL CHANGE.
>
> SIMON RIDGE, EXECUTIVE DIRECTOR RESOURCES SAFETY

SAFETY AND HEALTH RESOURCES SECTOR AWARD – FULL LIST OF WINNERS BY CATEGORIES

Engineering

- Winner – Rail-mounted working at heights platform, Rio Tinto
- Certificate of Merit – Enhancing electrical safety through DrawingBox, Aurecon
- Certificate of Merit – Drill of the future, FORACO Australia
- Certificate of Merit – Elimination of excess temperature and high-risk levels of Legionella bacteria in eyewash safety showers, Heat Trap Solar Pty Ltd
- Certificate of Merit – Improving the safety and reliability of distribution power lines, Rio Tinto
- Certificate of Merit – Safescape edge protector, Safescape

Systems and People

- Winner – Iluka Resources/Winston Partnership, Iluka Resources (South West Operations)
- Certificate of Merit – Innovative technology to manage onsite inductions, Aglime of Australia
- Certificate of Merit – Onsite – Suicidal ideation management, Fortescue Metals Group
- Certificate of Merit – Unmanned aerial system for abandoned pit lake sampling at Tallering Peak, Mount Gibson Mining
- Certificate of Merit – Critical risk management – Fatality Elimination Program, Rio Tinto

Safety Representatives

- Winner – The Safety Barometer, Fortescue Metals Group
- Certificate of Merit – Scenario-based learning, Fortescue Metals Group

SAFETY REPRESENTATIVE AWARD

The Safety Barometer, Fortescue Metals Group

This award called for nominations for safety and health innovations and leadership by an elected safety and health representative.

Simon Ridge, Executive Director Resources Safety, was involved in the judging process and said the Safety Barometer submitted by Fortescue Metals Group (FMG) is a great innovation that empowers safety and health representatives.

"There can be no doubt that safety and health representatives are a key component in driving change and the achievement of safe workplaces. Good information provides for good decision making.

"The Safety Barometer provides FMG's safety and health representatives with critical feedback information that assists them in the performance of their duties," Mr Ridge added.

The Safety Barometer is about understanding the impact attitude and distraction can have on safety and provides a tool to target the way people are feeling in the workplace.

The Safety Barometer encourages self-diagnosis within work groups, builds ownership of safety, identifies proactive action opportunities, provides a platform that is not just about facts and data, and recognises the human factor.

Since introducing the Safety Barometer, FMG has seen real results in identifying issues, creating greater unity, and has advanced how its mobile maintenance team works.

The Safety Barometer project team with Mr Stephen Price MLA (right)

SYSTEMS AND PEOPLE AWARD

The Iluka Resources / Winston Partnership

The judges said there was a high number of quality submissions in this category that all scored well within the criteria.

The judging panel included Greg Heylen, Chief Executive Officer, BGC Contracting, who said the Iluka Resources/Winston Partnership was successful because of its focus on the mental health issues that present obvious challenges in both the community and resources sector.

"The Iluka Resources South West Operations team has taken an innovative and unique approach to raising the awareness of mental health issues within their workforce, the resources industry and the wider community."

The team partnered with local Dardanup farmers, Peter and Judy Milton to sponsor a steer called Winston.

Linking in with Iluka's volunteering program, employees provide support, enabling Winston to attend a range of high profile events.

Peter and Judy, along with health professionals, aim to raise the awareness of mental health issues and break down the stigma around such issues.

Winston has become an icon for mental health on the Iluka site and has enabled opportunities for all staff to contribute to the work the Milton family is doing in the community.


Iluka Resources

ENGINEERING AWARD

Rail-mounted working at heights platform, Rio Tinto

Nominees for the Engineering category were required to demonstrate innovation in maintenance, engineering and/or infrastructure to enhance safety and health.

Nicole Roocke, Deputy Chief Executive, Chamber of Minerals and Energy of Western Australia, who was one of the judges, said the panel took into consideration that falls from heights and overexertion are in the industry's top ten list of incidents.

"Rio Tinto's rail-mounted working at heights platform provides for a safe, ergonomic work area for multiple operators to undertake the tasks required of them while preventing falls and minimising the need for bending, crouching or over reaching, addressing key issues for the industry."

Ms Roocke added the winner created a unique and innovative solution that addressed this significant risk.

While work platforms are not new, this solution adds the innovative approach of mounting onto the existing stacker rail, allowing for easy relocation, easier access to the conveyor rollers, and reducing the falling from heights risk.


Rio Tinto

Kyle Tatam and David Bradbury from FMG's project team for Onsite – suicide ideation management

Ben O'Grady, Mount Gibson Mining, presented his project on an unmanned aerial system for sampling abandoned pit lake

SHARING AWARD WINNING SAFETY AND HEALTH INNOVATIONS

An important part of the Department of Mines, Industry Regulation and Safety Awards for Excellence program is to encourage others in the resources sector to continually improve and be at the forefront of social, safety and environmental outcomes.

Presentations from the Systems and People finalists at the Safety and Health Resources Sector Awards are now available online.

The five finalists who presented their projects were:

- Innovative technology to manage onsite inductions, Aglime of Australia
- Onsite – suicide ideation management, Fortescue Metals Group
- Iluka Resources/Winston Partnership, Iluka Resources (South West Operations)
- Unmanned aerial system for abandoned pit lake sampling at Tallering Peak, Mount Gibson Mining
- Critical risk management – fatality elimination program, Rio Tinto.

To register your interest for the 2018 DMIRS Awards for Excellence, please email your details to **excellenceawards@dmirs.wa.gov.au**

Anthony Deakin, Rio Tinto, gave a presentation about his project on critical risk management and fatality elimination

> THESE SESSIONS ARE AN IMPORTANT OPPORTUNITY FOR MINE INSPECTORS, SAFETY AND HEALTH REPRESENTATIVES AND FRONTLINE SUPERVISORS TO COME TOGETHER AND DISCUSS SAFETY AND HEALTH IN THE MINING INDUSTRY.
>
> ANDREW CHAPLYN,
> DIRECTOR MINES SAFETY

2017 MINES SAFETY ROADSHOW DRIVES IMPORTANCE OF TRAFFIC MANAGEMENT

The Resources Safety Division's 2017 Mines Safety Roadshow (roadshow) travelled across Western Australia in October and November raising awareness about mining-related safety and health issues.

Starting in Kalgoorlie, sessions were held in Leonora, Newman, Cloudbreak, Tom Price, Karratha, Port Hedland, Bunbury, Mandurah and Geraldton, before finishing in Perth.

Department of Mines, Industry Regulation and Safety Director Mines Safety, Andrew Chaplyn, said the roadshow included the latest series of the *Know Your Hazards* safety videos.

"These sessions are an important opportunity for mine inspectors, safety and health representatives and frontline supervisors to come together and discuss safety and health in the mining industry," Mr Chaplyn said.

"It is particularly important to get out into the regions and meet with a large audience who may not be able to get to a Perth-based session."

This year's roadshow saw more than 750 people attend one of the 13 sessions across Western Australia.

"It has continued to grow and is an important opportunity for Resources Safety to collaborate with workers on significant safety and health issues," Mr Chaplyn said.

The theme for this year's roadshow was traffic management.

"Unfortunately, we frequently see examples in Western Australia – and around the world – of serious incidents, injuries and fatalities involving vehicles on mine sites," Mr Chaplyn said.

"This is why we are concentrating on the importance of traffic management and how safe systems, safe vehicles and safe people can contribute to a safe mining operation."

The roadshow included an update from the regulator on what is happening in mine safety and health in Western Australia, and information about transporting dangerous goods.

KNOW YOUR HAZARDS – FOURTH INSTALMENT NOW AVAILABLE

Traffic management incidents accounted for twenty-five per cent of Western Australian mining fatalities between 2000 and 2015.

This is one of the reasons the Department of Mines, Industry Regulation and Safety made traffic management the focus of the fourth instalment of the *Know Your Hazards* video series.

According to Director Mines Safety, Andrew Chaplyn, mine sites feature a range of vehicles as part of their operations, and traffic management is critical for the safety for mining operations.

"When things go wrong with traffic management, workers can be hurt or killed," he said.

Mr Chaplyn said the videos, produced by the Department, highlight the importance of traffic management and how safe systems, safe vehicles and safe people can contribute to a safe mining operation.

"The videos feature real-life stories, re-enactments and technical, factual material," he said.

"This series aims to help supervisors and work teams recognise common workplace hazards that have injured or killed people – in this case, the hazards associated with traffic management.

"Being able to correctly identify hazards is the first step towards reducing the risk of accidents in the workplace."

The latest instalment premiered at the 2017 Mines Safety Roadshow and the videos are available to download from the Department's website at **www.dmirs.wa.gov.au/ResourcesSafety**


Bunbury SA

RISK MANAGEMENT TRAINING ENGAGEMENT AT ROADSHOW

Dr Marcus Cattani from Edith Cowan University (ECU) presented at the roadshow and asked attendees to let him know what information and training they need, specifically to assist with the implementation of the new safety and health legislation, when introduced.

Attendees were provided with samples of Dr Cattani and Professor Russell Jones' training via an online platform.

With around 1300 questionnaires collected from the 2016 and 2017 Roadshows, there are some interesting observations of attendees' information and training needs.

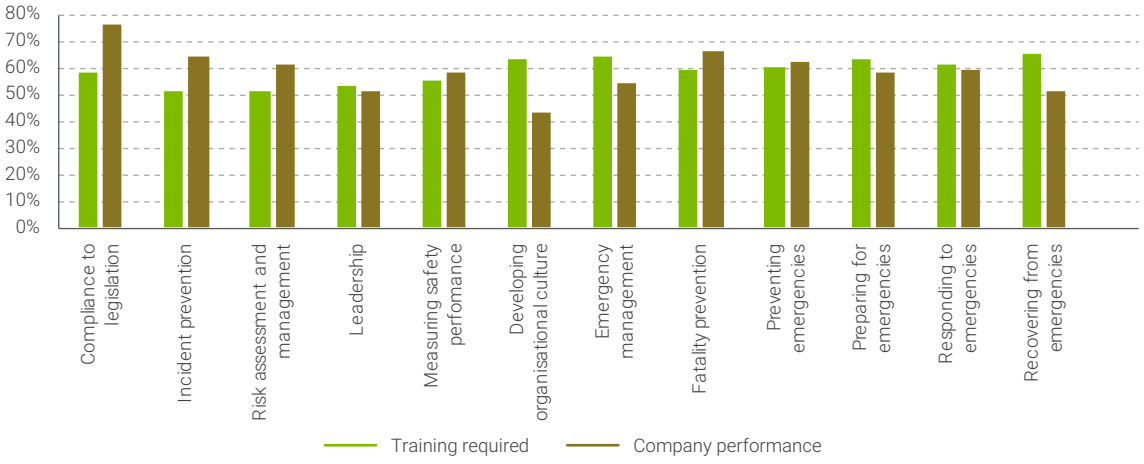
While Dr Cattani is developing a more thorough analysis that will be published in 2018, his initial findings show industry is well qualified (68 per cent with 1.2 qualifications per person).

Most people would like further training (57%), particularly in developing emergency management (64%), organisational culture (63%) and legislative compliance (58%). Although they thought the online training was effective they would prefer a classroom-based training program – this will be investigated further.

It is interesting to compare individuals' training needs with their perception of their employers' effectiveness (see graph below). While most people think they are adequately trained (above 50 per cent on the graph), their employers have variable effectiveness – most notably, there is some work to do in developing organisational culture and leadership.

Contact Marcus at **m.cattani@ecu.edu.au** for more information.

Training vs company performance




Newman SA


Tom Price SA

From left: Team Leader Dangerous Goods, Erin James; Rail Group Manager Abbott Risk Consulting, Steve Bickley; Principal Scientific Officer DFES, Jeff Davis; Principal Dangerous Goods Officer, Peter Xanthis; Senior Dangerous Goods Officer, Stephen Lane

RAIL SAFETY FOCUS FOR FORUM

The importance of rail transport safety was highlighted recently at the Department's first Dangerous Goods Rail Safety Forum, held on 17 October.

Team Leader Dangerous Goods, Erin James, said the forum was an important part of the Department's dangerous goods transport 2017 safety program.

"The forum brought together dangerous goods rail consignors and consignees, emergency management professionals and regulators to discuss safety," Miss James said.

"The forum focused on risk management and control of dangerous goods transportation by rail, and also aimed to improve industry's understanding of emergency response planning, management and capabilities within Western Australia."

The event is part of the Department's commitment to improving safety compliance and safety culture associated with the transport of dangerous goods by rail.

This commitment was recently recognised when the Department was announced as a state finalist in the Government Award category for the 2017 Resilient Australia Awards.

The awards recognise and promote initiatives that strengthen community disaster resilience across the nation.

Toolbox presentation from the 2017 Rail Safety Forum are now available on the Department's website, visit **www.dmirs.wa.gov.au/DangerousGoods** to download.

> THESE AWARDS RECOGNISE OUTSTANDING OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT, INNOVATIONS AND SOLUTIONS IN BOTH PUBLIC AND PRIVATE SECTOR WORKPLACES IN WA THAT REDUCE THE RISK OF WORK-RELATED INJURY AND DISEASE.
>
> SIMON RIDGE

2017 WORK SAFETY AWARDS WESTERN AUSTRALIA WINNERS ANNOUNCED

Winners of the 2017 Work Safety Awards Western Australia were announced at the Work Safety Awards breakfast hosted on 6 October 2017 by the Department of Mines, Industry Regulation and Safety

RAC WA, Fremantle Commercial Diving and The Lifting Company, Kimberley Ports Authority, City of Cockburn and Alison Marais were all category winners.

Acting Deputy Director General Safety, Simon Ridge, said the five winners were examples of the many excellent workplace innovations and occupational safety and health systems being developed in WA.

"These awards recognise outstanding occupational safety and health management, innovations and solutions in both public and private sector workplaces in WA that reduce the risk of work-related injury and disease," Mr Ridge said.

"Awards such as these are all about encouraging best practice in safety and health, and the winners are leading the way by making a significant contribution to making WA workplaces safer.

"I heartily congratulate all the very worthy winners and finalists, along with everyone else who nominated for this year's awards."

Visit **www.dmirs.wa.gov.au/WorkSafe** for more information on the Work Safety Awards Western Australia.

From left: Member for Forrestfield, Stephen Price MLA; The Lifting Company, Matthew Clark; Kimberley Ports Authority, Paul Taylor; CADDS Group, Alison Marais; RAC WA, Jennie Milne; City of Cockburn, Samantha Baron; Fremantle Commercial Diving, Antony Old; Department of Mines, Industry Regulation and Safety, Simon Ridge

WINNERS OF THE WORK SAFETY AWARDS WA 2017

Best workplace safety and health management system

Winner: RAC WA

Safety and health invention of the year

Winner: Fremantle Commercial Diving and The Lifting Company (joint award)

Best solution to a specific workplace safety and health issue

Winner: Kimberley Ports Authority

Best initiative to encourage worker engagement in safety and health

Winner: City of Cockburn

Best individual contribution to safety and health by an individual or team

Winner: Alison Marais from CADDS Group

FOCUSING ON INNOVATIONS IN THE WA RESOURCES INDUSTRY

A new safety product designed in Western Australia aims to protect resources industry workers who work with industrial scissors and shears.

The safety scissors holster was developed by Bradley Bond of Bond Safety Products, and was a finalist in the safety and health invention of the year category at the 2017 Work Safety Awards Western Australia, held in October.

Mr Bond said the safety scissors holster has been specially designed to safely store industrial scissors and shears.

"In the past, the only protection that is offered when using razor sharp tools is a retractable lanyard to prevent dropped objects," Mr Bond said.

"This leaves workers typically carrying scissors or shears in their pockets – an extremely dangerous practice."

Mr Bond developed the safety scissors holster in response to the risks of accidental injury. The holster safely stores scissors and shears, and can be used with a retractable lanyard.

"The new product prevents dropped objects, trip hazards and poor housekeeping, all potential causes of serious injury in the workplace," Mr Bond said.

Director Mines Safety, Andrew Chaplyn (second from left) with members of the MERC Organising Committee, Sue Steele, Jim Mullens and Jen Pearce

District Inspector of Mines, Peter O'Loughlin presented at the second annual information session on emergency management

PLANNING FOR EMERGENCIES

The second annual Emergency Management Information Session was held on 24 November 2017.

The event, which coincides with the Mining Emergency Response Competition (MERC), brought together those who have functions in and responsibilities for planning, designing, implementing and maintaining emergency response systems.

State Mining Engineer and Director Mines Safety, Andrew Chaplyn, officially opened proceedings and said the event played an important role in the Department's *Towards 2020* vision for a safe and healthy resources sector.

"We are committed to working with industry to improve emergency management across WA mining operations," Mr Chaplyn said.

The information session provided a status report on upcoming guidance, including the emergency management code of practice and emergency management audit.

Other topics included the importance of standardising emergency management systems, the role of the Department's dangerous goods officers in Hazmat emergency response, along with an overview of MERC by the event organisers.

Following the information session, attendees toured the MERC competition grounds at Langley Park.

EMERGENCY MANAGEMENT CODE OF PRACTICE – COMING SOON

Following public comment and stakeholder feedback, the *Emergency management for Western Australian mining operations – code of practice* is in the final stages of approval.

The code aims to assist industry in:

- identifying the key factors to consider when undertaking emergency response activities, including hazard identification and risk management
- establishing an emergency plan as part of the site's safety management system
- understanding the broader occupational health and safety requirements for undertaking emergency response in accordance with the legislation.

The code has been endorsed by the Mining Industry Advisory Committee (MIAC) and it is anticipated it will be available to industry early in 2018 following approval from the Minister for Mines and Petroleum.

DANGEROUS GOODS FIELD DAYS – GETTING TO KNOW THE BROAD-ACRE FARMER

As part of the Department's *Towards 2020* strategy, we are committed to improving the transport and storage of dangerous goods within the agricultural sector. This is why the Department is focused on attending regional events such as agricultural field days and performing inspections of agricultural stores and vehicles carrying dangerous goods.

In August and September, officers from the Dangerous Goods and Petroleum Safety Branch travelled to Western Australia's rural regions to engage with the farming community and spread dangerous goods safety messages.

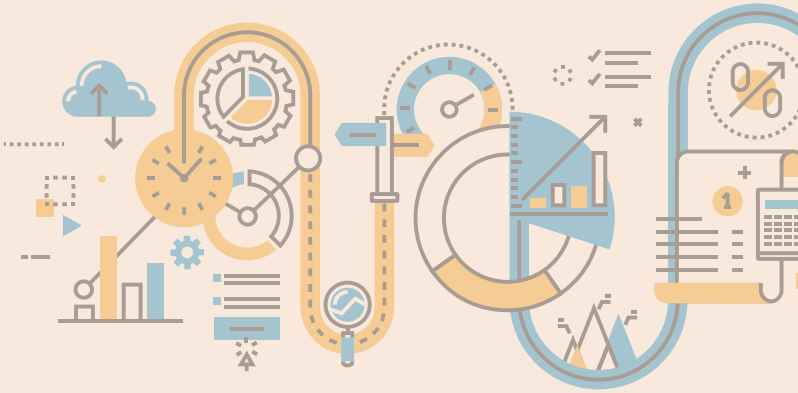
Alongside AgSafe's Bevan Henderson, the officers set up stalls at the Mingenew Mid-West Expo and Newdegate Machinery Field Day for two days of information-sharing and conversations with locals.

The combined Department and AgSafe stall at each event was filled with guidance material and helpful posters to assist visitors with everything from identifying dangerous goods, to how to make a vehicle compliant when transporting dangerous goods. Visitors were also encouraged to enter a competition to win a "Safety show bag" featuring a range of personal protective equipment.

This year we focused on delivering information on segregation, ventilation and restraint of dangerous goods loads. The field days provided an excellent opportunity for dangerous goods officers to engage with the farming community, local agricultural stalls and other exhibitors. They also inspected the Newdegate fireworks display.

The partnership with AgSafe enhanced the exhibition as it allowed for synergies and bouncing ideas and information off each other. Mr Henderson is well-known in farming communities and his familiar face helped draw locals to the display.

The Expo and Field Day allowed the Department to get involved in the rural community, and provided an opportunity for farmers and rural community members to have face-to-face interaction with the regulators. The Department hopes to continue its presence at these rural events in the years to come.



Towards 2020

Regulatory strategy for a safe and healthy resources sector

Towards 2020 describes the goals, focus areas and measures of success for safety and health initiatives undertaken by the regulator.

Latest update: Progress on commitments

Find out more at **www.dmp.wa.gov.au/Towards2020**

Department of Mines, Industry Regulation and Safety @DMIRS_WA

MINISTERIAL ADVISORY PANEL ON WORK HEALTH AND SAFETY REFORM

In July 2017, the Minister for Mines and Petroleum, Commerce and Industrial Relations, Bill Johnston, established a Ministerial Advisory Panel (MAP) on Work Health and Safety (WHS) Reform.

The Panel advises on the development of a single harmonised and amalgamated WHS Act, covering general industry and the resources sector in Western Australia.

MEMBERSHIP

The Minister has appointed Ms Stephanie Mayman as Chair. In addition to her extensive occupational safety and health experience, Ms Mayman brings a wealth of knowledge to the role as chair of the Commission for Occupational Safety and Health (COSH).

Other MAP members are:

- Ms Adrienne La Bombard, representing the Chamber of Minerals and Energy WA
- Ms Rachael Lincoln, representing the Chamber of Commerce and Industry WA
- Mr Owen Whittle, representing UnionsWA
- Ms Penny Bond, Ministerial Senior Policy Adviser
- Mr Simon Millman MLA, Member for Mount Lawley
- two representatives from the Department of Mines, Industry Regulation and Safety.

TERMS OF REFERENCE

The Government intends to introduce a single WHS Bill regulating work health and safety in Western Australia into Parliament as soon as possible. The Bill will be administered by the Department and the role of the Panel will then be to advise on the relevant industry regulations.

The MAP will advise the Minister on the content of the WHS Act, having regard to:

- the current legislation, being the:
  - *Occupational Health and Safety Act 1984*
  - *Mines Safety and Inspection Act 1994*
  - *Petroleum and Geothermal Energy Resources Act 1967*
  - *Petroleum (Submerged Lands) Act 1982*
  - *Pipelines Act 1969*
  - *Petroleum and Geothermal Energy Safety Levies Act 2011*.
- the importance of implementing harmonised laws in Australia, implementing the optimal structure and content of the Model WHS Act in drafting the single Act.
- whether the matters regulated under the *Dangerous Goods Safety Act 2004* should either be incorporated into the single Act or remain as a standalone, but modernised, Act.

INCREASED PENALTIES FOR WORKPLACE HEALTH AND SAFETY OFFENCES

On 27 August 2017, Premier Mark McGowan announced proposed increases to penalties for workplace health and safety offences, to bring Western Australia in line with other states and ensure penalties better reflect the importance of a safe workplace.

The Minister for Mines and Petroleum, Commerce and Industrial Relations, Bill Johnston, introduced two amendment bills into Parliament on 11 October 2017.

Subject to Parliament passing these bills, amendments will be made to increase penalties for offences under the *Mines Safety and Inspection Act 1994* and *Occupational Safety and Health Act 1984*.

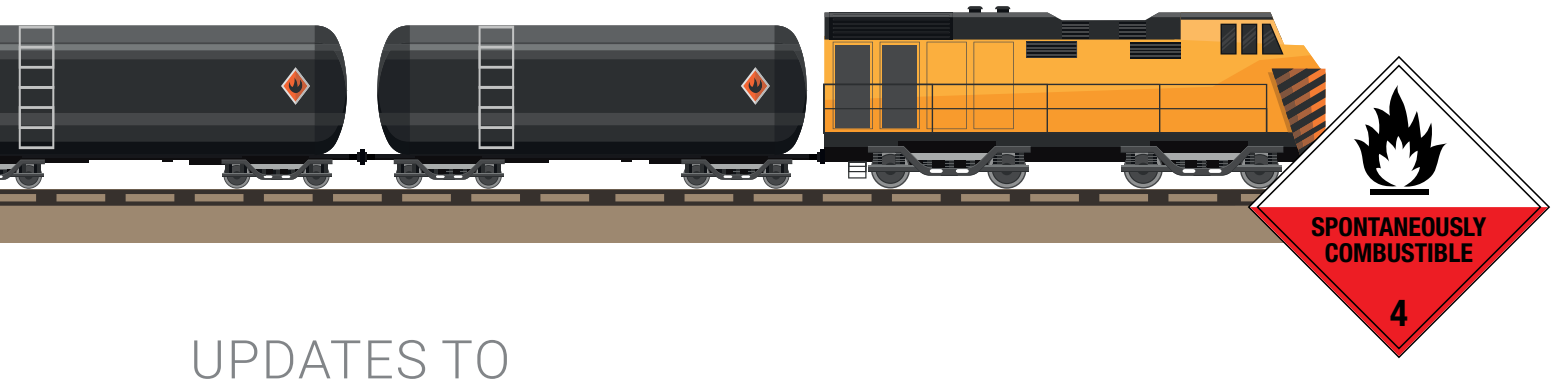
Penalties under these Acts have not been changed since 2004, and the amendments will align Western Australia's penalties more closely with the model Work Health and Safety Act adopted by most other states.

The Mining Industry Advisory Committee (MIAC) and the Commission for Occupational Safety and Health (COSH) were consulted on the proposed changes.

MSI Act provision	Penalty level	Duty holder	Current MSI Act penalty	Proposed penalty
s. 4A(1)(a)(i)	Level 1	First employee	$5,000	$50,000
s. 4A(1)(a)(ii)	Level 1	Subsequent employee	$6,250	$60,000
s. 4A(1)(b)(i)(I)	Level 1	First individual	$25,000	$100,000
s. 4A(1)(b)(i)(II)	Level 1	Subsequent individual	$31,250	$120,000
s. 4A(1)(b)(ii)(I)	Level 1	First body corporate	$50,000	$450,000
s. 4A(1)(b)(ii)(II)	Level 1	Subsequent body corporate	$62,500	$570,000
s. 4A(2)(a)(i)	Level 2	First Individual	$100,000	$250,000
s. 4A(2)(a)(ii)	Level 2	Subsequent individual	$125,000	$350,000
s. 4A(2)(b)(i)	Level 2	First body corporate	$200,000	$1,500,000
s. 4A(2)(b)(ii)	Level 2	Subsequent body corporate	$250,000	$1,800,000
s. 4A(3)(a)(i)	Level 3	First individual	$200,000	$400,000
s. 4A(3)(a)(ii)	Level 3	Subsequent individual	$250,000	$500,000
s. 4A(3)(b)(i)	Level 3	First body corporate	$400,000	$2,000,000
s. 4A(3)(b)(ii)	Level 3	Subsequent body corporate	$500,000	$2,500,000
s. 4A(4)(a)(i)	Level 4	First individual	$250,000 and 2 years imprisonment	$550,000 and 5 years imprisonment

MSI Act provision	Penalty level	Duty holder	Current MSI Act penalty	Proposed penalty
s. 4A(4)(a)(ii)	Level 4	Subsequent individual	$312,500 and 2 years imprisonment	$680,000 and 5 years imprisonment
s. 4A(4)(b)(i)	Level 4	First body corporate	$500,000	$2,700,000
s. 4A(4)(b)(ii)	Level 4	Subsequent body corporate	$625,000	$3,500,000

Mines Safety and Inspection Act 1994		Current fine	Proposed fine
10A	**Breaches of s. 10(1) or (3), penalties for**		
10A(1)(a)	First offence	$25,000	$100,000
10A(1)(b)	Subsequent offence	$31,250	$120,000
10A(2)(c)	First offence	$20,000	$80,000
10A(2)(d)	Subsequent offence	$25,000	$100,000
10A(3)(c)	First offence	$10,000	$40,000
10A(3)(d)	Subsequent offence	$12,500	$50,000
11	**Duty to report some occurrences and situations**		
11(4)	Person	$10,000	$40,000
21	**Powers of inspectors**		
21(5)	Corporation	$25,000	$100,000
21(5)	Individual	$5,000	$20,000
23	**Record of inspection and notice of result**		
23(3)	Corporation	$25,000	$100,000
23(3)	Individual	$5,000	$20,000
26	**Use and disclosure of information by inspectors etc.**		
26(3)	Person	$10,000	$40,000
95	**Continuing offences (daily)**		
95(2)(a)	Person	$200	$800
95(2)(b)	Individual	$1,000	$4,000
95(2)(c)	Body corporate	$2,000	$8,000



UPDATES TO DANGEROUS GOODS REGULATIONS

SUMMARY OF DANGEROUS GOODS AMENDMENT REGULATIONS MADE IN 2017

Amendments to accommodate the GHS

Amendments to the dangerous goods regulations took effect on 4 March 2017 to accommodate the increasing use of the Globally Harmonised System of Classification and Labelling of Hazardous Chemicals (GHS).

The amendments do not introduce the GHS, they only respond to the interstate introduction of the GHS to assist industry to avoid additional costs. The GHS was introduced nationally to comply with model Work Health and Safety Regulations 2011, developed under the leadership of Safe Work Australia.

Western Australia will introduce work health and safety law using the GHS as part of a new *Work Health and Safety Bill*. The bill will cover both the resources sector and general industries, and repeal the acts listed below.

- *Mines Safety and Inspection Act 1994*
- *Occupational Safety and Health Act 1984*
- *Petroleum and Geothermal Energy Resources Act 1967*
- *Petroleum Pipeline Act 1969*
- *Petroleum (Submerged Lands) Act 1982*
- *Petroleum and Geothermal Energy Safety Levies Act 2011*

All dangerous goods safety regulations under the *Dangerous Goods Safety Act 2004* will continue to use the UN dangerous goods classification system.

Dangerous goods labelling and safety data sheets

The main purpose of these amendments is to eliminate the cost of re-labelling GHS-compliant packaging and re-writing GHS-compliant safety data sheets (SDS).

The amendments primarily target the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 and allow GHS labelling of dangerous goods packages and GHS-SDSs as alternatives to the current use of dangerous goods labelling and material safety data sheets (MSDSs).

All references to "material safety data sheet" have now been replaced with "safety data sheet".

Definition of combustible liquids

The definition of a "combustible liquid" has been changed to exclude all currently regulated substances with a flashpoint higher than 93°C. Higher flashpoint liquids are not considered sufficiently hazardous to warrant a dangerous goods classification.

This is a welcome de-regulatory change and corresponds to the GHS classification system, making it easier for industry to identify combustible liquids to be treated as dangerous goods.

All references to "C1 combustible liquid" have been simply replaced with "combustible liquid".

Any dangerous goods site licence holder who identifies that its combustible liquid either has a flash point higher than 93°C or is not classifiable by the GHS as a "Flammable Liquid Category 4" now, has a non-dangerous good, and may contact the Department to remove the liquid from the its site licence.

NEW COMBUSTIBLE LIQUID DEFINITION

Combustible liquid means a liquid that is not a Class 3 dangerous good that has –

(a) A flashpoint that is no higher than 93°C; and

(a) A fire point, as defined in AS 1940-2004, that is less than the boiling point.

NEW SAFETY DATA SHEET DEFINITION IN THE REGULATIONS

Safety data sheet (SDS), for particular dangerous goods, means a document in English that contains the information in relation to the dangerous goods that is required by —

(a) the *National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition* [NOHSC: 2011 (2003)] (ISBN-1-920763-10-4); or

(b) the *Preparation of Safety Data Sheets for Hazardous Chemicals – Code of Practice* published by Safe Work Australia in February 2016 (ISBN 978-0-642-33311-7)

Amendments to the transport of dangerous goods regulations

The latest amendments to the Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007 took effect on 12 July 2017.

The most important amendment is the adoption of the latest edition of the ADG Code (ADG7.5) updated to the 19th edition of the *UN Model Regulations on the Transport of Dangerous Goods*. For the purpose of classification of dangerous goods, the latest edition of the *UN Manual of Tests and Criteria* (6th edition) must now be consulted. ADG7.5 contains a summary of all changes on page xxvii.

ADG7.5 can be downloaded for free from the website of the National Transport Commission (NTC). It is also available in hardcopy at a fee.

Western Australia has adopted the new edition and kept to the nationally-agreed transition period that ends on 1 March 2018, when industry must be compliant with the new code.

There are two parts to the amendments.

1. Part 1 – National NTC reform package No. 4 endorsed by the Transport and Infrastructure Council on 4 November 2016. This adopts the new ADG7.5 and introduces a higher placard load limit for "limited quantity" and "domestic consumable" dangerous goods of 2,000 kg/L. A new simplified transport document, set out in Figure B2 of Appendix B of ADG7.5, can now be used to transport a limited quantity of dangerous goods used for "personal care and household purposes" as well as "domestic consumable" dangerous goods. This method replaces the current method used by supermarkets of transporting these items as "Retail Distribution Load".
2. Part 2 – Miscellaneous amendments to accommodate WA-specific requirements to meet the needs of Western Australian stakeholders, including the following.
   (a) Partial exemption for the transport of dangerous goods in a mobile processing unit (MPU) that manufactures bulk explosives at a mine site. This exempts operators of MPUs from having to comply with the ADG Code, making them comply with the *Code of Practice – Mobile Processing Units (MPU Code)* issued by The Australian Explosives Industry Safety Group instead.
   (b) Giving legal effect to Chapter 7.2 of the ADG Code regarding "Transport of empty packagings". This allows industry to make full use of the procedures set out in section 7.2.7 – "Transport of nominally empty storage vessels" without having to seek an exemption from the Chief Dangerous Goods Officer.
   (c) Clarifying which types of "road tank vehicles" require a licence. The definition of "road tank vehicle" has been aligned with the ADG Code. This means that road tank vehicles with "demountable tanks" need to be licensed, but road vehicles with "portable tanks" continue to be excluded from the need for a licence.
   (d) Updating the medical standard for the issue of medicals to dangerous goods drivers to the fifth edition (2016) of *Assessing Fitness to Drive for Commercial and Private Vehicle Drivers*.

MENTAL HEALTH WEEK RECAP

The second week of October marked the 50th anniversary of Mental Health Week. This was a particularly significant milestone as it highlighted the substantial work over the past five decades, that has gone into advocating for those in the community impacted by mental health conditions.

Mental Health Week aims to reduce the stigma associated with mental ill-health by providing education on prevention and how to access appropriate support services. Protection of mental health and promotion of early intervention are key to improving the outcomes of mental health diagnoses. Stigma presents a barrier to this being achieved.

Appreciating the progress that has been made in reducing stigma can be difficult from one year to the next if you are not directly involved in the process. However, reflecting on the past 50 years, we can see the significant progress that has been made. Many of us would have a personal story of how it has changed, whether that is observing differences in health care available, noticing changes in the language used to reference mental health, or just hearing about the topic more often.

If the success of mental health week was measured by participation, then the fact that more community events were organised across metropolitan and regional areas than any previous year is a good sign.

Resources Safety showed its support by providing silver sponsorship for all the official events, and by organising internal information sessions and opportunities to 'connect' on the topic of mental health for the Department's employees.

The mental health conversation will be carried on during the Department's site visits for the next 12 months with the help of blue shirts provided to all inspectors to raise mental health awareness during face-to-face interaction with industry. The feedback on this initiative so far has been very positive.

Mental Health Week 2017 has provided an opportunity to celebrate achievements, and in doing so, renewed determination and energy for continuing with progress over the next 12 months.

BEYOND MENTAL HEALTH WEEK – CONTINUING TO ADDRESS THE STIGMA

Stigma is defined as a mark of disgrace associated with a particular circumstance, quality or person. As it happens, the most stigmatising attitudes towards mental health are held by men aged between 16 to 44 years old – the same group of people who are most at risk of death by suicide.

The problem with stigma is that it causes people to feel ashamed. People who feel ashamed tend to blame themselves for their circumstances, feel hopeless about the chances of the situation improving and, consequently, don't ask for help.

Stigma silences people. If the stigma of mental ill-health, or simply the stigma of struggling with various life stressors, can be removed then the likelihood of people asking for help is increased.

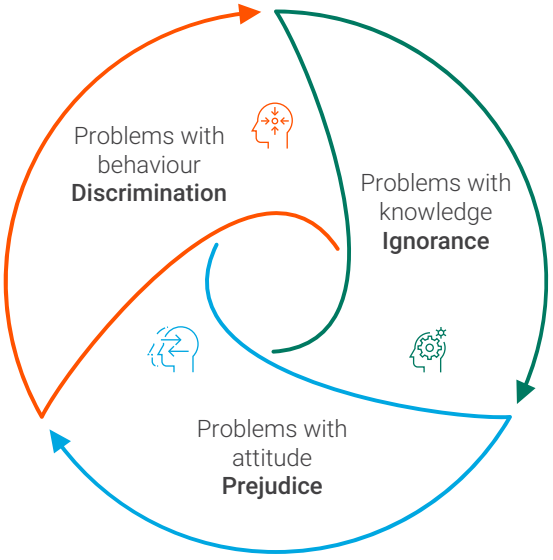
By identifying the components of stigma, we can better understand how it comes about and importantly, how we can stop it.

Stigma is made up of three 'problem areas'.

1. **Knowledge** – a lack of knowledge or inaccurate information, which may be described as ignorance.
2. **Attitudes** – ignorance will influence people's thoughts and feelings toward the stigmatised group. If the attitudes (thoughts and feelings) are negative, they may be described as prejudicial.
3. **Behaviour** – behaviour based on prejudicial attitudes, which results in the stigmatised group being treated differently, is called discrimination.

In order to address stigma, it is helpful to address all of these problem areas.

If people behave as they have always behaved, they never find new information to correct their lack of knowledge or attitude, and so the stigma cycle continues.



Stigma cycle

Ways to reduce the stigma

Increase knowledge

- Educate the workforce about mental health
- Provide training on how to protect mental health
- Become familiar with which life stressors the workforce is likely to experience

Influence attitudes

- Focus on protection of mental health – this is possible, it does not have to be reactive
- Provide statistics that normalise mental health conditions – many people are affected
- Promote supportive attitudes and quickly address unhelpful attitudes

Adjust behaviours

- Develop processes and procedures that guide people about how to behave in supportive and helpful ways
- Identify psychosocial hazards and put controls in place
- Add psychosocial hazards and controls to the risk register and other in-field risk assessments

Note: A psychosocial harm audit and guide are available on the Department's website.

Photo courtesy MATES in Mining

MATES IN MINING LAUNCHES

A new mental health program, MATES in Mining, aims to reduce suicide among Australian mine workers.

MATES in Mining is a charity organisation established in 2017 to foster ownership and control of suicide prevention in the Australian mining industry. The program is based on the simple idea that "suicide is everyone's business".

Improving the mental health and wellbeing of workers and reducing suicide in the Australian mining industry cannot just be left to the mental health professionals – everyone in the industry must play their part.

MATES in Mining provides suicide prevention assistance through community development programs on mine sites, case management support for workers, and a 24-hour helpline. It is independent of employers and unions, and never works directly for a particular employer, only for the mining industry in general. Programs are delivered across the industry regardless of employer or union affiliation.

Following several years of research by the Australian mining industry, focused broadly on mental health and wellbeing, the industry collectively (companies and unions) decided to embark on the MATES journey, following in the footsteps of the highly successful MATES in Construction program.

MATES in Construction had worked with the mining industry for the past five years. It initially trialled the General Awareness and Connector training on several mine sites and more recently did the full rollout of the MATES model at Glencore's Glendell and Clermont mine sites.

"WE ARE LOOKING FORWARD TO THIS PROGRAM SUPPORTING ALL MINE WORKERS, NO MATTER WHERE THEY ARE BASED."

ANDREW MCMAHON
MATES IN MINING PROJECT MANAGER

MATES IN MINING HELPLINE

Life can get hard sometimes. Those big issues stack up and we don't know where to start. Between relationships, family, work, money - sometimes it's all a bit too much for us.

If a mate is struggling and you want to offer them a hand, please do something – contact **MATES in Mining's National Helpline on 1300 642 111**.

But please remember, helplines don't save people – PEOPLE SAVE PEOPLE.

So don't just hand the number over and say, "Hey mate, call this". A real mate says, "Hey mate, let's call MATES in Mining together. I'm sure they can help us, so let's see what we can do. What do you think, mate?"

The rollout of the program was made possible thanks to a $520,000 grant from the New South Wales-based Coal Services Health and Safety Trust.

MATES in Mining has appointed Andrew McMahon as the MATES in Mining project manager. Andrew has a strong background in mining, having worked for the Minerals Council of Australia and the NSW Minerals Council as director of health and safety. He helped guide the industry on investigating mental health issues, publishing the industry's landmark *Mental Health and Wellbeing Blueprint*. He is a passionate suicide prevention and mental wellbeing advocate, and making a difference.

"It's a simple program," Andrew said, "It's really just mates helping mates – something we are all brilliant at."

MATES in Mining recently presented at the Western Australian Ministerial Council on Suicide Prevention community forum in Kalgoorlie and also met with several companies and Western Australia's mines safety regulator.

"We are looking forward to this program supporting all mine workers, no matter where they are based," Andrew said.

If you know a mine site that may be interested in the MATES model, email Andrew at **amcmahon@matesinmining.org.au**, visit the website at **www.matesinmining.org.au** or like and share the MATES in Mining Facebook page (@matesinmining).

FIFO – THE BIG FOUR ISSUES

While there are some great benefits to working in a fly-in, fly-out (FIFO) job, it's a balancing act to ensure this unique lifestyle is sustainable.

As well as her personal experience as a wife and mother in a FIFO family, Mining Family Matters co-founder, Alicia Ranford, has chatted with thousands of miners and identified common themes in what they and their families find most challenging about the FIFO lifestyle. The top four issues that Alicia identified are:

- missing big family events
- staying connected to the kids
- workplace mental health
- keeping the 'home fires burning'.

"The most important message we always give to workers and families is that they're not alone in finding the FIFO lifestyle tough sometimes," Alicia said, "and there are practical ways to deal with these four common challenges."

In order to get those practical solutions out there, Alicia and her friend and journalist, Lainie Anderson, launched the Mining Family Matters website in February 2010.

Alicia developed the website after she noticed her young children struggling to cope with their father's FIFO roster. The aim of the website is to provide free professional support and practical advice to other Australian families in mining, oil and gas who might be experiencing similar struggles.

In the space of five years, Alicia and Lainie have grown the website readership to thousands every month, and sold more than 120,000 copies of their FIFO family survival guides.

EXPERT ADVICE ON MANAGING THE BIG FOUR KEY ISSUES

- **Missing big family events**
  - Remember, there's no law that says major birthdays, anniversaries or even your family Christmas need to be celebrated on any given day (or can't be celebrated twice).
  - If you feel sad or anxious, get it off your chest by talking to a trusted friend or family member so your children don't "wear" your unhappiness.
  - On big days that you're apart, be kind to yourselves and each other.
- **Staying connected to the kids**
  - Young children can be very literal, so replace phrases like "going away" with "going to work".
  - On the phone, replace uninspiring questions ("How was your day?") with open, informed queries ("How'd you go in the spelling test?" or "What made you laugh today?").
  - Be present when you're home (e.g. drive your children to school and to sport).
  - Stay in touch with teenagers through text messages and social media. Don't use working away as an excuse to be disconnected.
- **Workplace mental health**
  - Set strong goals that will keep you focused in challenging times.
  - Stay healthy with smart food choices and decent sleep.
  - Encourage a similar focus on mental health as physical health in the workplace.
  - Remember that depression and anxiety are common and can be treated, and skills can be learnt to manage stress.
  - Take advantage of confidential employee assistance programs.
- **Keeping the 'home fires burning'**
  - Remember that life is not a competition – you're both exhausted!
  - Regularly reassess how you're coping and be proactive with support systems like a gardener, cleaner or grandparents to babysit to give you both a break.
  - Be open and honest.
  - Discuss issues as a team (replace "How are YOU going to fix this?" with "What can WE do?")

To find out more about Mining Family Matters, visit the website **www.miningfm.org.au**

GLASSBODY CAMPAIGN TO REDUCE RISKS

The Mental Health Commission is running an alcohol and health campaign called *Glassbody*. The campaign focuses on the damaging effects of alcohol. It emphasises the body's fragility and how reducing alcohol consumption can reduce a person's risk of alcohol-related disease, such as stroke, heart attack and cancer.

The campaign encourages people to have no more than two standard drinks on any day, in accordance with the National Health and Medical Research Council (NHMRC) guideline, to help reduce their risk of alcohol-related harm over a lifetime.

Sir Charles Gairdner Hospital gastroenterologist, Dr Hooi Ee, and The University of Western Australia's Neurology Professor, Dr Graeme Hankey, have both seen the damaging effects alcohol has on their patients and have been instrumental in the development of this campaign.

As part of the campaign, a new easy-to-use online tool has been released on the Alcohol.Think Again website. The tool lets users enter their current drinking habits and receive a health risk rating. By then entering new reduced drinking goals, the tool shows how their health risk would be reduced, as well as the reduction in kilojoule intake and the money they would save.

The campaign and online tools work together to reinforce the *Reducing drinking will reduce the risks* message of the campaign.

The ads and online tools are available at **alcoholthinkagain.com.au**

USING THE ONLINE TOOL

Example: Sally has three standard drinks a day. By using the online tool she has learnt that she has three times the risk of alcohol-related death compared to others of the same gender who drink within the national guidelines. The online tool then showed Sally that if she reduced her drinking to three times a week – drinking within the national alcohol guidelines – she would not only reduce her health risks, but she would also benefit financially, saving around $900 over 12 months, and reducing her kilojoule intake by 18,000 kJ.

HOW MANY WESTERN AUSTRALIANS ARE AT RISK DUE TO THEIR DRINKING BEHAVIOURS?

Alcohol consumption can have long term impacts on an individual's health. Nearly 1 in 14 Western Australians drink every day, and nearly 1 in 5 drink at levels that place them at risk of alcohol-related harm and ill-health in their lifetime.

PREVENTING THE MISUSE OF VOLATILE SUBSTANCES

Inhaling volatile substances is an issue that continues to affect communities and towns in Western Australia. It is a dangerous practice that can have devastating effects on the user, their families and the community. Volatile substance use (VSU) can cause brain damage and even death.

While the underlying reasons why people inhale substances are complex, access to volatile substances is a significant factor. There is a large range of industrial products that are commonly sought out by some people for the purpose of inhaling. As products are often stolen from worksites, vehicles and local tips, mining companies and contractors may unintentionally be enabling access to these products.

If your work site is near a town or community that may have a VSU issue, or you are a contractor who works in or around a high-risk town or community, you can help limit access by ensuring that substances such as glues, paints and other solvents are used, stored and transported securely and disposed of in a responsible manner.

The Mental Health Commission, in conjunction with the Department of Prime Minister and Cabinet, has developed an industry information kit – *Support for Preventing the Misuse of Volatile Substances: Industry Information Kit* – to inform and support industry and contractors to use, store, transport and dispose of volatile substances in a responsible way.

The industry information kit has been distributed to all mining companies across the State. If you wish to obtain further copies, please contact Angela Rizk on (08) 6553 0233 or **vsu@mhc.wa.gov.au**. Alternatively, you can visit the Mental Health Commission's VSU website at **https://vsu.mhc.wa.gov.au/**

WHAT YOU CAN DO TO HELP REDUCE VSU AROUND YOUR WORK SITE?

Use	• Where possible, use non-solvent-based products and aerosols with alternative propellants • Use low aromatic fuel (where available). If you usually use unleaded fuel, top up your tank with low aromatic fuel when you arrive at a community or town • Use diesel-powered equipment where low aromatic fuel is not available • Make sure you know what volatile substance products are in your possession and check them before you leave a community or town. If anything is missing, report it to the police
Store	• Keep all volatile substance products and petrol-powered equipment locked up and out of sight • Ensure only authorised personnel can access products when onsite
Transport	• Ensure your vehicle is locked at all times, especially when unattended
Dispose	• Take all used and unused volatile substance products with you when you leave a community or town • Ensure all volatile substance products are disposed of at secure sites not accessible to the general public
Review	• Ensure accurate inventories of products are undertaken • Regularly review storage, transportation and disposal practices of all volatile substance products

THRIVE@WORK

A partnership between the Mental Health Commission and The University of Western Australia's Centre for Transformative Work Design will see the development of a comprehensive set of mental health support resources for Western Australian workplaces.

Thrive@Work will encourage mentally healthy and well-designed workplaces, and will support organisations to address the health and wellbeing of their employees.

Creating a mentally healthy and well-designed workplace has benefits for employers and employees as it supports individual mental health, increases employee engagement and improves productivity.

The strategy will also support the Western Australian Workplace Mental Health Standards, a set of voluntary guidelines to assist organisations in the journey towards becoming workplaces where employees are able to thrive.

Meaningful employment and well-designed workplaces provide people with an important sense of purpose, which contributes to mental wellbeing. It can also assist with recovery from factors that can contribute to the development of mental health issues, such as stress, unsustainable workloads, challenging shifts and inter-personal interactions at work.

Given the many hours people spend at work each week, workplaces have the potential to impact peoples' mental health – both positively and negatively. Almost half of Australians will experience a mental health issue in their lifetime, so it is important organisations know how to create settings and environments in which people are supported.

CELEBRATING 70 YEARS OF SCIENCE IN HUMAN AND ORGANISATIONAL FACTORS

1 October 2017 marked the 70th anniversary of one of the most influential publications in human factors.

The research conducted by Fitts and Jones in 1947 was so influential in the area of human factors within aviation because they applied a scientific approach when trying to understand why human errors made sense.

According to the latest edition of the US Naval Aviation safety magazine *Approach*, Fitts and Jones gathered pilot performance data by studying various types of errors, interviewing pilots about their experiences and considering human strengths and weaknesses of how we process information. The pair analysed the errors from the perspective that the errors occurred as the "result of interactions between multiple components in the cockpit" and determined that "errors can result from the interaction of multiple components".

HUMAN AND ORGANISATIONAL FACTORS AREN'T NEW

In a world where we are always on the hunt for the next big thing, which quickly becomes yesterday's news, there is some comfort to be had in the fact that when it comes to safety, we are basing our plans for progress on a discipline of science that set its foundations more than 100 years ago – the concept of human and organisational factors (HOFs) is not new.

- 1898 – Frederick W Taylor researched the best shovel design in the pursuit of increased productivity.
- 1911 – Frank B Gilbreth studied problems with bricklaying and invented the scaffold, which tripled the number of bricks laid per hour.
- 1918 – The USA defence department established laboratories for conducting research on various human factors-related areas at the Brooks and Wright-Patterson Air Force Bases.
- 1924 – The National Research Council USA initiated a study into various aspects of human relations, including impact of illumination, length of workday and rest periods on productivity.
- 1940s – Following the end of World War Two, human factors or engineering came to be recognised as a specialised discipline.
- 1947 – Paul Fitts, psychologist, along with Air Force Captain, Richard Jones, of the Aeromedical Laboratory at Wright-Patterson Air Force Base, researched the results of hundreds of non-combat aviation accidents where pilot-error was described as the cause. Fitts and Jones concluded that the actual source of failure was poorly designed aircraft instruments.

According to the Chartered Institute of Ergonomics and Human Factors, "ergonomics emerged as a scientific discipline in the 1940s as a consequence of the growing realisation that, as technical equipment became increasingly complex, not all of the expected benefits would be delivered if people were unable to understand and use the equipment to its full potential."

WHAT ARE HUMAN AND ORGANISATIONAL FACTORS?

HOFs is the term given to all elements within a workplace that have an influence on the people who work there. For example, workers and their equipment, work procedures or environment.

"Initially, these issues were most evident in the military sector where high demands were placed on the physical and cognitive demands of the human operator. As the technological achievements of World War Two were transferred to civilian applications, similar problems of disharmony between people and equipment were encountered, resulting in poor user performance and an increased risk of human error. The analysis of poor performance, of what became known as man-machine systems (now human-machine systems), provided a growing body of evidence which could be linked to difficulties faced by the human operator. This stimulated research by senior academic and military physiologists and psychologists led to further investigations of the interactions between people, equipment and their environments."

UNDERSTANDING THE PRINCIPLES OF HUMAN PERFORMANCE

The way in which workplace elements are designed for interaction with humans will impact on human performance – how likely the human is to make an error. While advanced technology may be implemented for productivity reasons, it is important to remember that the human brain remains the same and will introduce unpredictable elements and limitations. The five principles of human performance that should be considered are listed below.

- People are fallible.
- Error-likely situations are predictable, manageable and preventable.
- Individual behaviour is influenced by organisational processes and values.
- People achieve high levels of performance because of the encouragement and reinforcement received from leaders, peers and subordinates.
- Events can be avoided through an understanding of the reasons why mistakes occur, and the application of the lessons learned from past events.

HUMAN ERROR – THE PLACE TO START

"Fitts and Jones remind us that human error is not the cause of failure, but a symptom of failure, and that 'human error' – by any other name or by any other human – should be the starting point of our investigations, not the conclusion." (Dekker, 2001).

THE IMPACT OF TECHNOLOGY

Undoubtedly technology is advancing quicker than ever before but it takes a lot longer for humans to evolve. Our brains don't evolve as quickly as the technology we are creating nor are the limitations of our brain being overcome. If you consider the impact of the internet on our attention span through multiple devices, some might say we are developing more limitations!

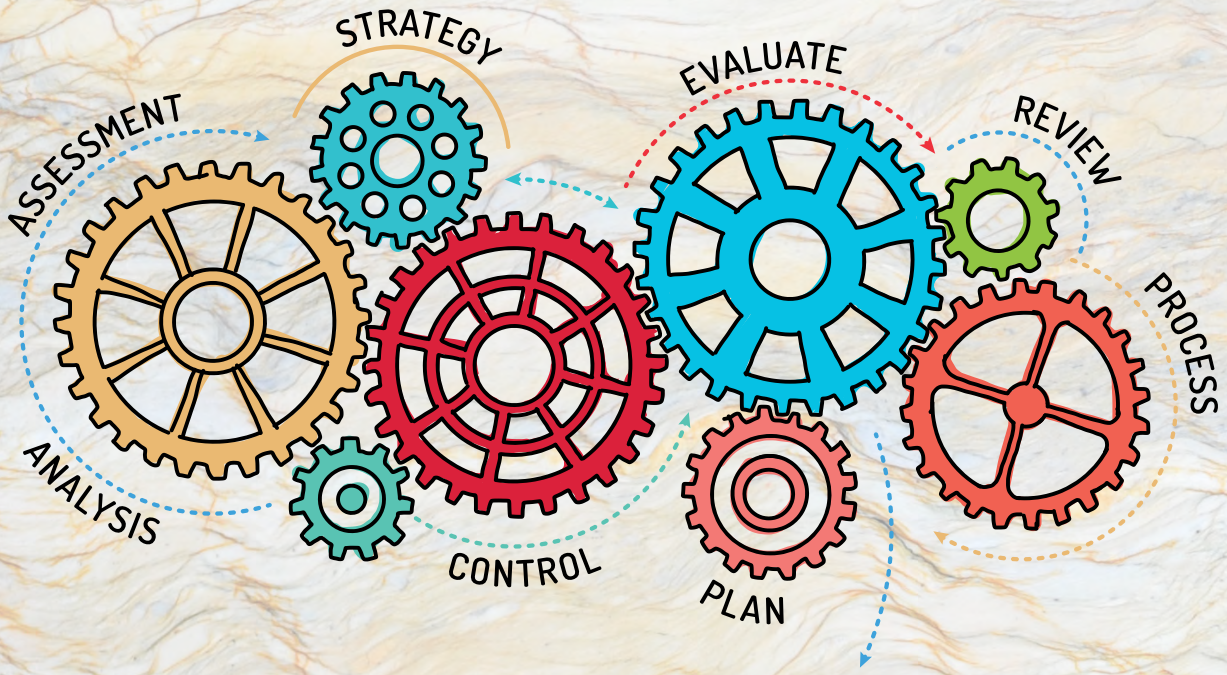
Approach magazine states that, "Human error' is still a prominent causal factor discussed within safety communities. The statistic often cited when discussing safety and human performance is that an estimated 80 percent of accidents are attributable to 'human error'. If only it were that simple. The statistic implies that most accidents can be traced to the solitary human component within a complex system and that the remaining accidents are attributable to mechanical failure. They often do not take into consideration strengths and weakness of human beings as performers in such systems. Humans have natural tendencies and limitations, especially in demanding situations."

So developing more technology is great but we still need to design it for the same operator unless we remove the operator altogether.

OPPORTUNITIES

A clear opportunity exists for the regulator to adapt and utilise available human factors literature and resources. This helps in the development of integrated safety improvement initiatives that recognise the role that human error plays at all levels. This role includes those outside the organisation, such as equipment manufacturers, suppliers and designers — not just the last person to touch the equipment.

Human and organisational factors is one of the key commitments in the Department's *Towards 2020* regulatory strategy, see **www.dmirs.wa.gov.au/ResourcesSafety**



STAY ALERT

Overview of significant incident reports and safety bulletins released since last issue to 31 November 2017

The safety alerts described below are reproduced in full at the back of this magazine, and can be downloaded from the publications section at www.dmirs.wa.gov.au/ResourcesSafety

Sign up to Resources Safety's weekly news alerts to receive the safety alerts when they are issued.

UNCONTROLLED ENERGY RELEASE DURING TRUNNION PIN REMOVAL

A purpose-built hydraulic tool was being used to remove a trunnion pin from a luffing cylinder. On the fifth removal attempt, a rod failed. There was an uncontrolled release of energy resulting in the ejection of parts.

Mines Safety Significant Incident Report No. 254 recommends the use of competent persons and engineering controls, as well as consultation with the original equipment manufacturer (OEM) when using purpose-built tools.

TELEHANDLER ROLLOVER DURING LIFT

Mines Safety Significant Incident Report No. 255 outlines an incident where a telehandler lifting a pipe assembly fell on its side when one of the slings attached to the load broke.

The importance of verifying competency and undertaking adequate risk assessments prior to lifting a load are discussed. There are also recommendations regarding the inspection and use of slings.

CLOSE CALL FOR PROCESS WORKER

A process worker on the platform of a tank had to jump a handrail onto an adjacent platform when the tank's roof burst and about 10,000 litres of hot slurry flowed out. The circumstances that led to the incident are discussed in *Mines Safety Significant Incident Report No. 256*.

Responsible persons are reminded of their legislative duties towards plant, including emergency exit provisions. Recommendations are also provided regarding change management.

MAINTENANCE WHEN TRANSPORTING UNODOURISED LP GAS

Dangerous Goods Safety Bulletin No. 0217 was issued following concerns about work practices in emergency breakdowns for vehicles carrying unodourised LP gas, particularly in rural and remote areas.

The bulletin discusses the incident that prompted the alert as well as recommended actions around safe systems of work, training, auditing, maintenance and supervision.

FIRE EXTINGUISHERS AND PETROL STATIONS

Concerns regarding the inaccessibility of fire extinguishers on petrol station forecourts led to the issuing of *Dangerous Goods Safety Bulletin No. 0317*. In some instances, due to theft, fire extinguishers have been kept in store or the key removed to the break glass.

Petrol station operators are reminded of legislative requirements and relevant Australian Standards for fire extinguishers, and to review risk assessments before moving safety equipment.

EXPLOSIVES SECURITY

To ensure the safety of the community is not put at risk, appropriate controls and procedures must be in place so that explosives are secure from sabotage, theft, unexplained loss and unauthorised access.

For industries engaged in the possession and use of explosives, *Dangerous Goods Safety Bulletin No. 0417* lists recommendations on explosives security. These include reviewing and updating the security plan and security risk assessment, management of contractors, auditing and reporting.

FIRE EXTINGUISHERS AND TRANSPORTATION OF DANGEROUS GOODS

Companies are required to carry dry chemical powder (DCP) fire extinguishers when transporting dangerous goods. There have been several incidents where these extinguishers were unsuccessful in putting out brake and tyre fires on vehicles carrying ammonium nitrate (AN).

In *Dangerous Goods Safety Bulletin No. 0517*, the Department strongly recommends that companies review the number and type of extinguishers, and consider carrying water-based fire extinguishers as well as DCP fire extinguishers.

Safety and health snapshot series

New titles available

The quarterly performance snapshots focus on injury and incident data provided to the department by the minerals sector for a three-month period, while the monthly safety and health snapshots address potential areas of concern in the minerals sector.

The latest monthly safety and health snapshots focus on natural hazards, ground control and hazardous manual tasks.

These snapshots can be used by employers and workers to assist in the development and promotion of safe work practices on mining operations.

Monthly and quarterly safety and health snapshot series can be viewed at
www.dmp.wa.gov.au/SafetySnapshots

NANO DIESEL PARTICULATE MATTER UPDATE

The August 2017 edition of *Resources Safety Matters* included an article about research on the characteristics of diesel particulate matter (DPM), nano diesel particulate matter (nDPM) and their health impacts on underground workers.

During October 2017, the research team visited AngloGold Ashanti Australia's Sunrise Dam mine to conduct in-field studies.

Data analysis and interpretation will commence shortly, and a draft report is scheduled for May 2018.

Industry is reminded that DPM has been classified as a Group 1 carcinogen, with a current adopted time-weighted average (TWA) exposure standard of 0.1 milligrams per cubic metre (elemental carbon) as an interim measure.

It is important to note that there is no safe exposure level at this stage. The principle of as low as reasonably practicable (ALARP) should be adopted by all mine operators.

DPM are exhaust particles produced by diesel engines

nDPM are smaller-sized diesel exhaust particles – less than 100 nanometres

WHAT CAN MINE OPERATORS DO TO PROTECT WORKERS

The most effective controls are still elimination and substitution. Engineering controls have so far only been able to reduce the emissions by selective catalytic reduction or filtration.

- Ensure engineering control is managed stringently. Guidance is available in the Department's *Management of diesel emissions in Western Australian mining operations – guideline*.
- Ensure the diesel engine fleet has baseline emission information and is regularly tested for gases and DPM. A triggered action response plan (TARP) should be in place to remove offending units for maintenance or repairs.
- Introduce multiple levels of controls to reduce the risk.
- Introduce high-efficiency particulate air (HEPA) cabin filters in diesel equipment.
- Use DPM-specific personal protective equipment (PPE) (P2 or P3 mask).
- Introduce real-time DPM and nDPM monitoring in workplaces.
- Design a 'used once' ventilation concept – delivering fresh uncontaminated air to work areas by eliminating series ventilation systems.
- Investigate higher levels of controls, such as electrification and battery mining equipment.
- Sponsor further studies.

COAL WORKERS' PNEUMOCONIOSIS UPDATE

Recent incidences of coal workers' pneumoconiosis have been reported in Queensland and New South Wales.

Other well-known types of pneumoconioses known to occur in workers exposed above exposure standards include asbestosis and silicosis. As their names imply, these conditions are the result of inhaling high concentrations of asbestos fibres and crystalline silica, respectively. Coal workers' pneumoconiosis (often referred to as CWP) occurs after many years of inhaling coal dusts.

The severity of all pneumoconioses depends on the physical and chemical composition of the inhaled particles, exposure duration, individual sensitivities related to co-exposure to cigarette smoke and respiratory conditions, like asthma (that are inherited) in addition to the concentrations inhaled. Therefore it is imperative that exposure to all dusts and particulates is kept as low as reasonably practicable (ALARP).

WA MINING OPERATIONS RESPONSIBILITY

In Western Australia, all mining operations have a legal responsibility to monitor exposures to hazardous materials, including dusts, fumes and gases released from all processes. Where there is a risk of employees being exposed at levels that could cause disease, and there is an appropriate test to screen employees, there is a requirement for health surveillance to be undertaken. This is outlined under section 75 of the *Mines Safety and Inspection Act 1994* and regulations 3.27 and 3.28 of the Mines Safety and Inspection Regulations 1995.

Pneumoconiosis is a lung disease that develops from inhaling large concentrations of dust or fibres over a long time and the nature and severity of the disease is dependent on the characteristics of the particles inhaled.

CWP or 'black lung disease' is caused by long-term exposure to coal dust.

Employers are responsible for establishing and maintaining a system to monitor the health of their employees accordingly, and notify the Department of Mines, Industry Regulation and Safety whenever an employee is diagnosed with an occupational disease.

SUPPORTING INFORMATION ON HEALTH SURVEILLANCE

Information regarding health surveillance following cessation of the government collection and storage of MineHealth assessments is provided on the Department's homepage.

- Guidance about risk-based approach to health surveillance – webpage
- *Risk-based health surveillance and biological monitoring – guideline*
- *Frequently asked questions on health surveillance of mine workers – information sheet*

This content is currently being reviewed. Sign up to the news alert to be notified when updated versions are released at **www.dmirs.wa.gov.au/ResourcesSafety**

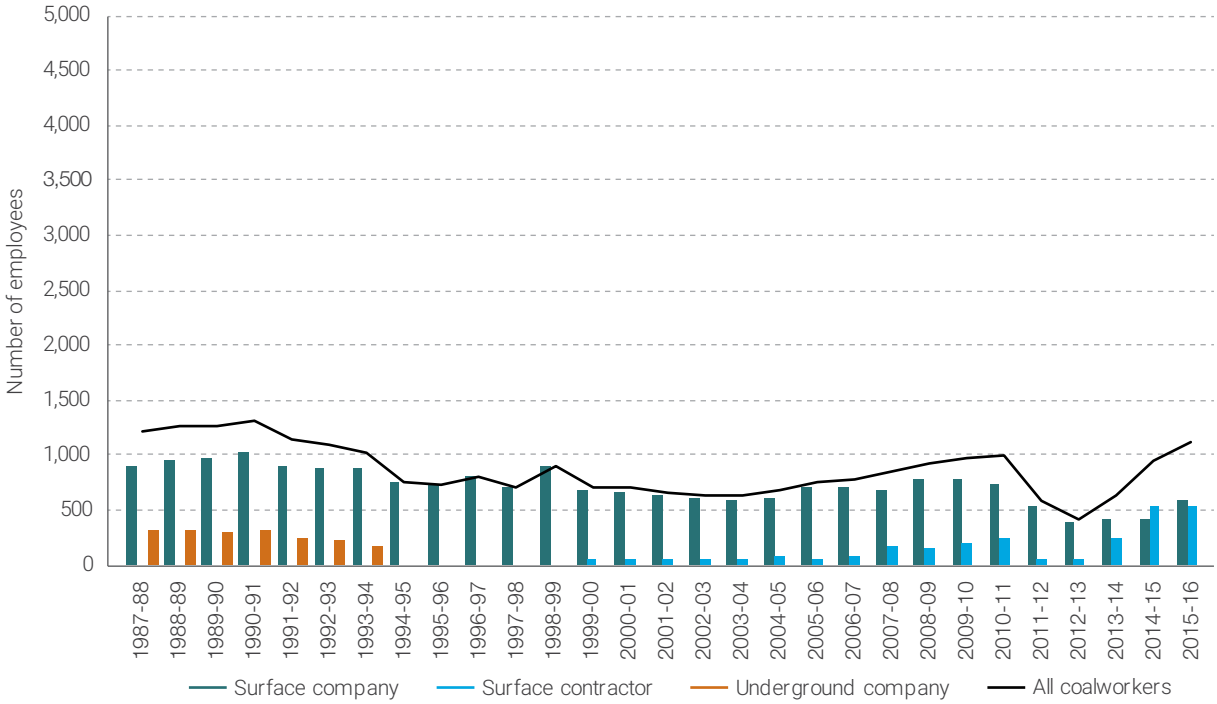


Figure 1 Number of employees in surface and underground coal mines in WA (1987 - 2016FY) (company versus contractor employers)

COMPARING WESTERN AUSTRALIA AND QUEENSLAND

A preliminary investigation of the personal exposure data for Western Australian coal workers has been undertaken and compared with the Queensland situation.

The two mining operations that currently constitute Western Australia's coal mining industry have had a stable workforce that peaked at 1,314 employees in 1990-1991 (see Figure 1). This is considerably smaller than the 51 operating coal mines in Queensland employing 29,428 people, of which 5,282 were working underground.

Surface coal mining currently predominates in Western Australia. Historically, however as many as 323 employees worked underground from 1987, with numbers dwindling until 1994 when the underground coal mines closed. Therefore, if exposure conditions were identical, the probability of emerging cases of CWP in Western Australia would also be significantly smaller than in Queensland.

As exposure concentration and duration are important risk factors for the development of CWP, the mean (arithmetic average) and maximum recorded concentrations are shown in Figures 2 to 5 for respirable coal dust, respirable dust (not otherwise classified), respirable crystalline silica, and inhalable dusts, respectively.

The graphs show that, while average exposures are generally significantly less than half of the exposure standards over the past 20 years, there have been occasions when significant exceedances did occur. It is therefore necessary to pay continued attention to controlling exposures.

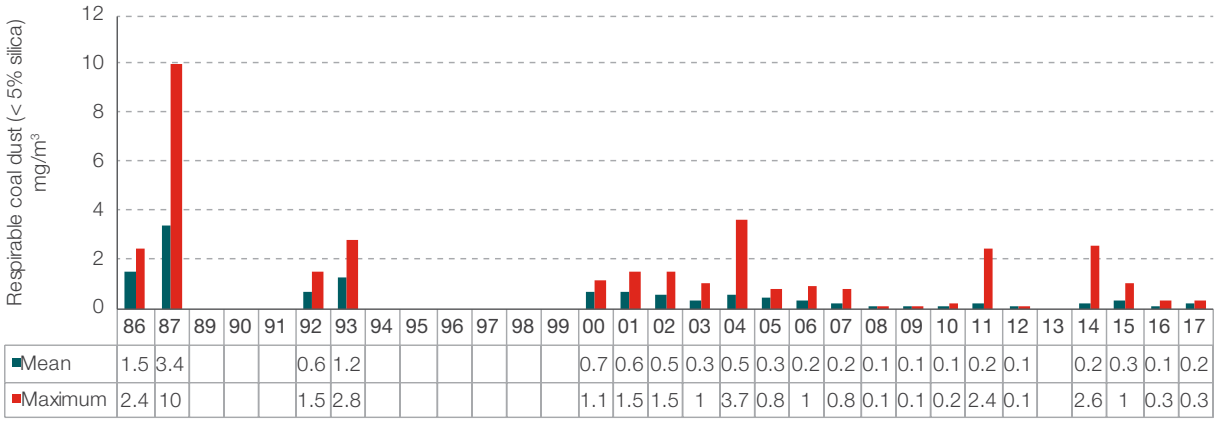
HOW TO PROCEED

To assist companies, the Department recently produced a fact sheet on how to investigate risk factors that contributed to an exceedance of the exposure standard (*Health and hygiene management – managing exceedances in SRS – information sheet*). It highlights the need for ongoing testing of controls and implementaton of effective hygiene management programs.

The Department continues to reinforce the requirement to identify, assess, control and monitor the effectiveness of controls for all health hazards, as well as exposure to dusts. This information should be documented in the site health and hygiene management plan. The *Health and hygiene management – understanding your responsibilities and regulatory requirements – information sheet* overviews regulatory requirements associated with health and hygiene management plans.

Safe Work Australia is in the process of reviewing exposure standards for all hazardous substances, including dusts implicated in causing pneumoconioses. Further online information is available from *Workplace exposure standards for chemicals* on the Safe Work Australia website.

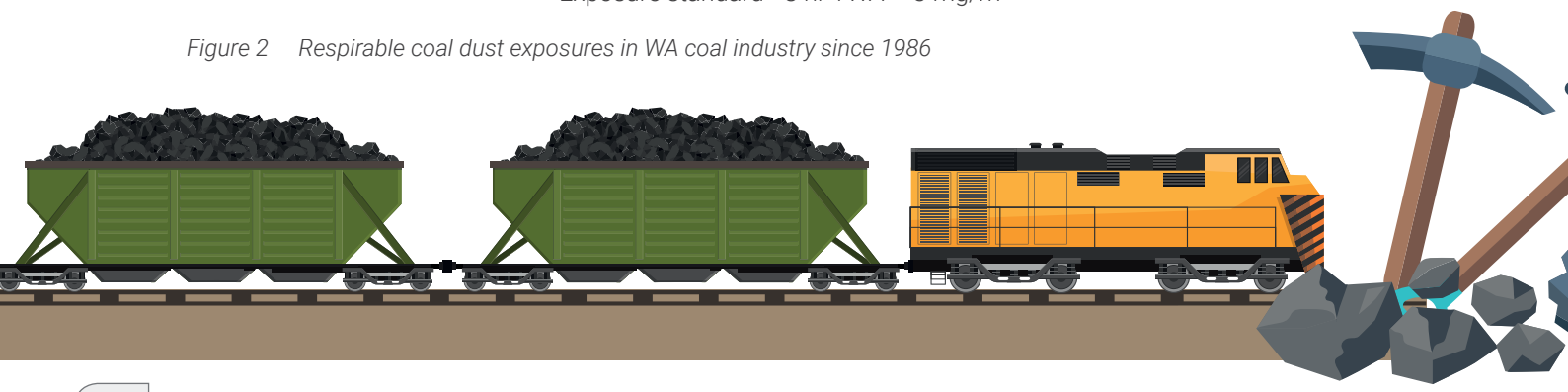
Parties wishing to participate in engaging in public consultation will be invited to do so in 2018.

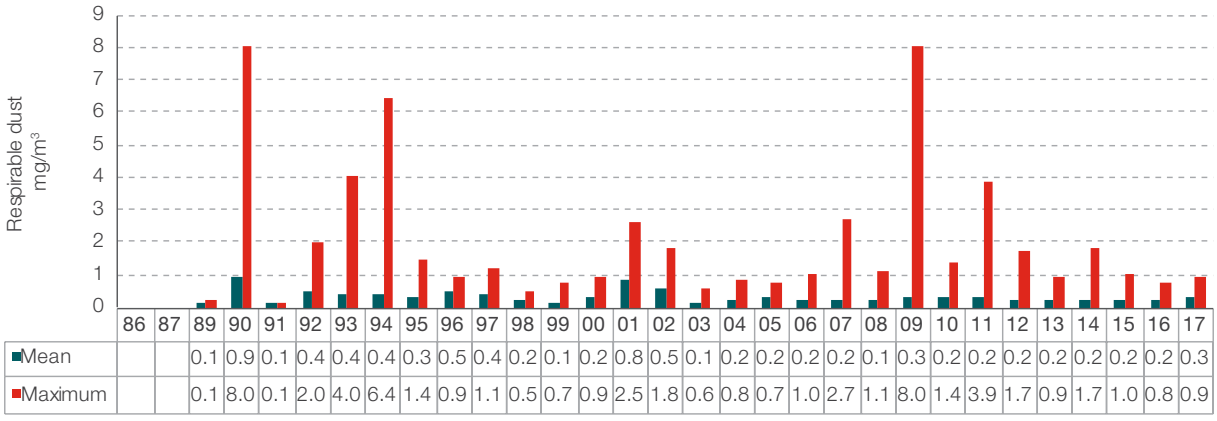


	86	87	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Mean	1.5	3.4				0.6	1.2							0.7	0.6	0.5	0.3	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1		0.2	0.3	0.1	0.2
Maximum	2.4	10				1.5	2.8							1.1	1.5	1.5	1	3.7	0.8	1	0.8	0.1	0.1	0.2	2.4	0.1		2.6	1	0.3	0.3

Exposure standard= 8 hr TWA – 3 mg/m³

Figure 2 Respirable coal dust exposures in WA coal industry since 1986





	86	87	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Mean			0.1	0.9	0.1	0.4	0.4	0.4	0.3	0.5	0.4	0.2	0.1	0.2	0.8	0.5	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Maximum			0.1	8.0	0.1	2.0	4.0	6.4	1.4	0.9	1.1	0.5	0.7	0.9	2.5	1.8	0.6	0.8	0.7	1.0	2.7	1.1	8.0	1.4	3.9	1.7	0.9	1.7	1.0	0.8	0.9

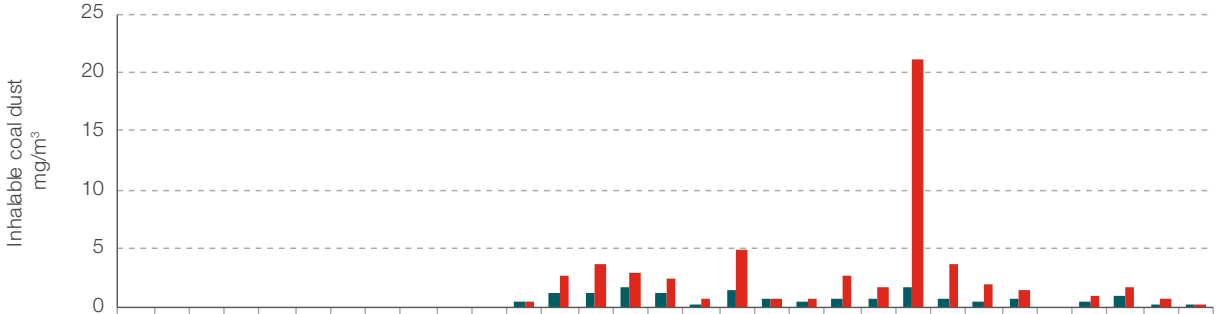
Exposure standard= 8 hr TWA – 3 mg/m^3

Figure 3 Exposure levels to respirable dust (not otherwise classified) in the WA coal industry since 1986

	86	87	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Mean									0.0								0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum									0.1								0.0				0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exposure standard= 8 hr TWA – 0.1 mg/m^3

Figure 4 Respirable crystalline silica exposures in the WA coal industry since 1986



	86	87	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Mean												0.4	1.1	1.2	1.7	1.1	0.3	1.4	0.6	0.5	0.6	0.6	1.7	0.7	0.4	0.6		0.4	0.9	0.2	0.2
Maximum												0.4	2.7	3.6	2.8	2.3	0.6	4.9	0.8	0.8	2.6	1.8	21	3.7	2	1.4		1	1.6	0.6	0.3

Exposure standard= 8 hr TWA – 10 mg/m^3

Figure 5 Exposure levels to inhalable dust (not otherwise classified) in the WA coal industry since 1986

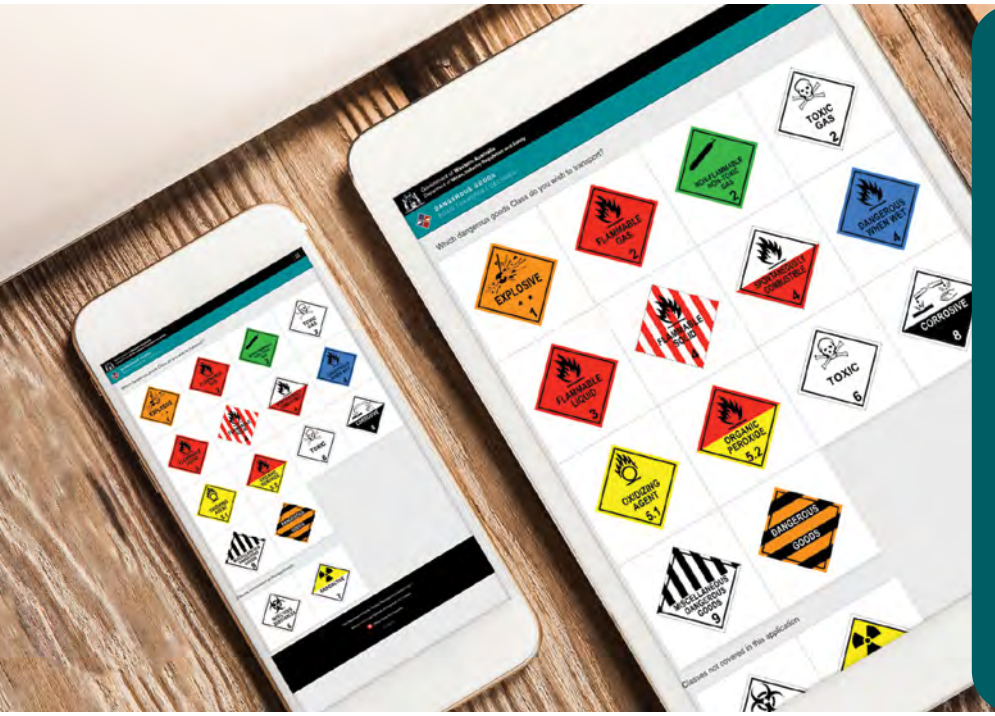
SAFETY CASE FIVE YEARLY REVIEWS

Raising awareness of the requirements and expected standard of safety case submissions is part of the Department's *Towards 2020* regulatory strategy.

Factors the Department considers when reviewing safety cases include:

- changes in the facility and any major accident events (MAEs) since the last review
- any changes to societal risk profiles
- review of learnings from relevant site incidents in the time frame
- review of any major incidents that have occurred globally within relevant industry over time
- status of retro HAZOP program and findings or commitment to change (i.e. so far as is reasonably practicable process) as part of any site's process safety management program
- outcomes and actions from inspections and audits
- status of the site's continuous improvement process
- anything else that operation determines may materially impact upon management of safety on site.

A safety case (and also to an extent the underpinning safety management system) is not a static system. Although a safety case review is formally required every five years, operators need to consider the ongoing management of risk at their sites and management's response to any changes.



> THE APP IS INCREDIBLY EASY TO USE AND HAS BEEN DEVELOPED AND TESTED OVER A TWO-YEAR PERIOD.
>
> SIMON RIDGE,
> EXECUTIVE DIRECTOR
> RESOURCES SAFETY

NEW APP PUTS DANGEROUS GOODS ROAD RULES IN DRIVERS' HANDS

A new app released by the Department of Mines, Industry Regulation and Safety helps drivers and transport companies easily access dangerous goods road transport information on their smartphones and computer tablets.

Developed by one of the Department's dangerous goods officers, the *Dangerous Goods Road Transport Decoder App* makes it easier than ever to access dangerous goods transport information to help drivers safely transport dangerous goods on Western Australian roads.

Resources Safety Executive Director, Simon Ridge, said the app was an innovative way to provide critical safety information.

"The app is incredibly easy to use and has been developed and tested over a two-year period," Mr Ridge said.

"Presenting the information in an easy-to-read format, users simply select the class of dangerous good and the packaging type being transported. The app then provides information about the transport safety requirements."

Mr Ridge said development of the app demonstrates the Department's commitment to using technology to communicate often-complex regulatory requirements in a simple and effective way.

"Better understanding of the regulatory requirements should translate to higher levels of compliance and safety on our roads when transporting dangerous goods," Mr Ridge said.

Principal Dangerous Goods Officer, Lawry Lim, initially developed a basic prototype in 2015, which he trialed at an industry exhibition in Perth.

"We received considerable interest from drivers, dangerous goods transport companies and other regulators," Mr Lim said.

Development of the full version of the app started in late-2016 and, for the past six months, the Department has been doing extensive testing.

The app can be downloaded from the Department's website at **https://decoderapp.dmirs.wa.gov.au**

KNOW YOUR HAZARDS – FLAMMABLE GAS AND IGNITION SOURCES DON'T MIX

Dangerous goods officers from the Department of Mines, Industry Regulation and Safety are on the lookout for unsafe storage, handling and transport of dangerous goods each time they are on the road.

EMERGENCY BREAKDOWN PROCEDURES WHEN TRANSPORTING UNODOURISED LP GAS

Last year, two officers were inspecting an industrial area in a regional centre when they came across a mechanic undertaking hot work on a bulk unodourised liquefied petroleum (LP) gas tanker pulled up on the side of the road. The wheel bearings had been overheating and a local mechanic was using a welding torch to repair the vehicle, in the driver's presence. On this occasion, the hot work was being done without a hot work permit, or an established exclusion zone and continuous gas monitoring.

LP gas is extremely flammable (Class 2.1) and comprises a mixture of hydrocarbons such as propane and butane. It ignites easily at room temperature and, when mixed with air in an enclosed space, can quickly form an explosive mixture. The gases can be ignited in the presence of an ignition source, such as a welding torch, if the appropriate procedures and controls are not in place. Unodourised LP gas presents an additional risk. The absence of mercaptans, which are added to give the gas an odour, means a gas detector is required to detect leaks rather than relying on smell.

The *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code) details that when transporting unodourised LP gas, properly calibrated and operational gas detectors must be used to monitor the atmosphere for the presence of the gas in the vicinity of the load (special provision AU03).

On this occasion, the officers found that the vehicle's gas detectors were not charged, and there were no records of readings taken at the vehicle's last stop, as required by special provision AU03. The mechanic conducting the repairs had no training in performing maintenance tasks in hazardous areas.

Factors contributing to this being an unsafe work practice include:

- failure to follow hot work safety procedures and special provision AU03
- no procedure or plan for vehicle breakdowns in regional areas
- inadequate training and supervision of maintenance contractors
- insufficient number of charging units for all electrical equipment (gas detectors) in the vehicle.

The prime contractor has a responsibility to ensure all reasonably practicable measures are taken to minimise the risk to people, property and the environment from the transport of dangerous goods. They must also ensure that any ignition source in a hazardous area is eliminated or, if this is not reasonably practicable, the risk arising from an ignition source is controlled.

WHAT CAN TRANSPORT OPERATORS DO TO ENSURE SAFE SYSTEMS OF WORK?

- Ensure emergency breakdown procedures are conducted in accordance with section 11.8.6, AS/NZS 1596 *The storage and handling of LP Gas*.
- Identify hazards prior to commencing any hot work in hazardous areas and complete a job safety analysis (JSA).
- Use a permit-to-work system to authorise all hot work and identify the required precautionary measures.
- Make sure appropriate and regular training is provided on hot work procedures, the proper use and calibration of gas detectors and job-specific hazards. Consider refresher training for long-term employees.
- Audit gas leak test records regularly to ensure that gas detector monitoring is being undertaken.

WHEN CONDUCTING MAINTENANCE IN HAZARDOUS AREAS

- Avoid hot work and use alternative methods whenever possible.
- Install additional hard-wired, gas-detector charging units in ad-hoc vehicles.
- Adequately supervise maintenance contractors conducting hot work and provide them with sufficient information about the specific hazards around dangerous goods.
- Consider pre-qualification of maintenance contractors in major regional centres.

LEARN MORE ABOUT SAFE SYSTEMS OF WORK

- Dangerous Goods Safety Bulletin No. 0217 *Emergency breakdown procedures when transporting unodourised LP gas*
- AS/NZS 1596 *The storage and handling of LP Gas*, Standards Australia, **www.standards.org.au**
- *Australian Code for the Transport of Dangerous Goods by Road and Rail*, Edition 7.5 **www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code**

DON'T DROP YOUR DG BUNDLE

PACKAGING REQUIREMENTS FOR DANGEROUS GOODS

As dangerous goods officers we are tasked with checking a large number of items when we inspect a truck or site. One item that can be overlooked by operators when storing or transporting a dangerous good is the packaging.

Plastic drums, plastic jerricans, rigid plastic intermediate bulk containers (IBCs) and composite IBCs with plastic inner receptacles have a life of five years. This simply means that after five years they can no longer be used to store dangerous goods - plastic packaging used for nitric or hydrofluoric acid has a lifespan of only two years from the date of manufacture.

Packaging that has passed its use by date has an increased risk of failing, either in normal operation or in the event of an accident. There has been a number of incidents reported to the Department where out-of-date packaging has failed.

Packaging that is used for dangerous goods is required to be tested and meet certain criteria (with the exception of packaging for limited quantities).

Did you know that packaging has a maximum lifespan stipulated by the current version of the *Australian Code for the Transport of Dangerous Goods by Road and Rail*?

This testing must be performed by a recognised testing facility, as defined in regulation 57 of the Dangerous Goods Safety (Road and Rail Transport Non-explosives) Regulations 2007. A report is then submitted to the competent authority for approval. In Western Australia, the competent authority is the Chief Dangerous Goods Officer of the Department of Mines, Industry Regulation and Safety. Once the packaging is approved, it is issued with a packaging approval number that contains information to enable those responsible for the transport of dangerous goods to quickly identify if the goods are packaged in the correct container.

An example of a packaging approval number

Unapproved containers damaged during the transport of dangerous goods

The packaging approval number is preceded by (the UN approval mark) and contains package marking codes separated by slashes. It designates the type of packaging and its construction material, a code for the packaging group and mass or density, whether it contains a solid (S), or the test pressure of the container for liquids, the year of manufacture, the country of manufacture, and the approval number.

In some cases, the packaging approval number will also have extra information. For example, packaging approval numbers for IBCs may also list the approved stacking weight.

See Section 6.1.2 of the *Australian Dangerous Goods Code* (ADG 7.5) for more information on packaging codes.

Understanding the safety requirements for dangerous goods packaging is essential for prime contractors, drivers and consignees, all of whom are involved as part of the transport chain of responsibility.

USEFUL RESOURCES

Australian Code for the Transport of Dangerous Goods by Road and Rail Edition 7.5 (ADG Code). National Transport Commission, www.ntc.gov.au

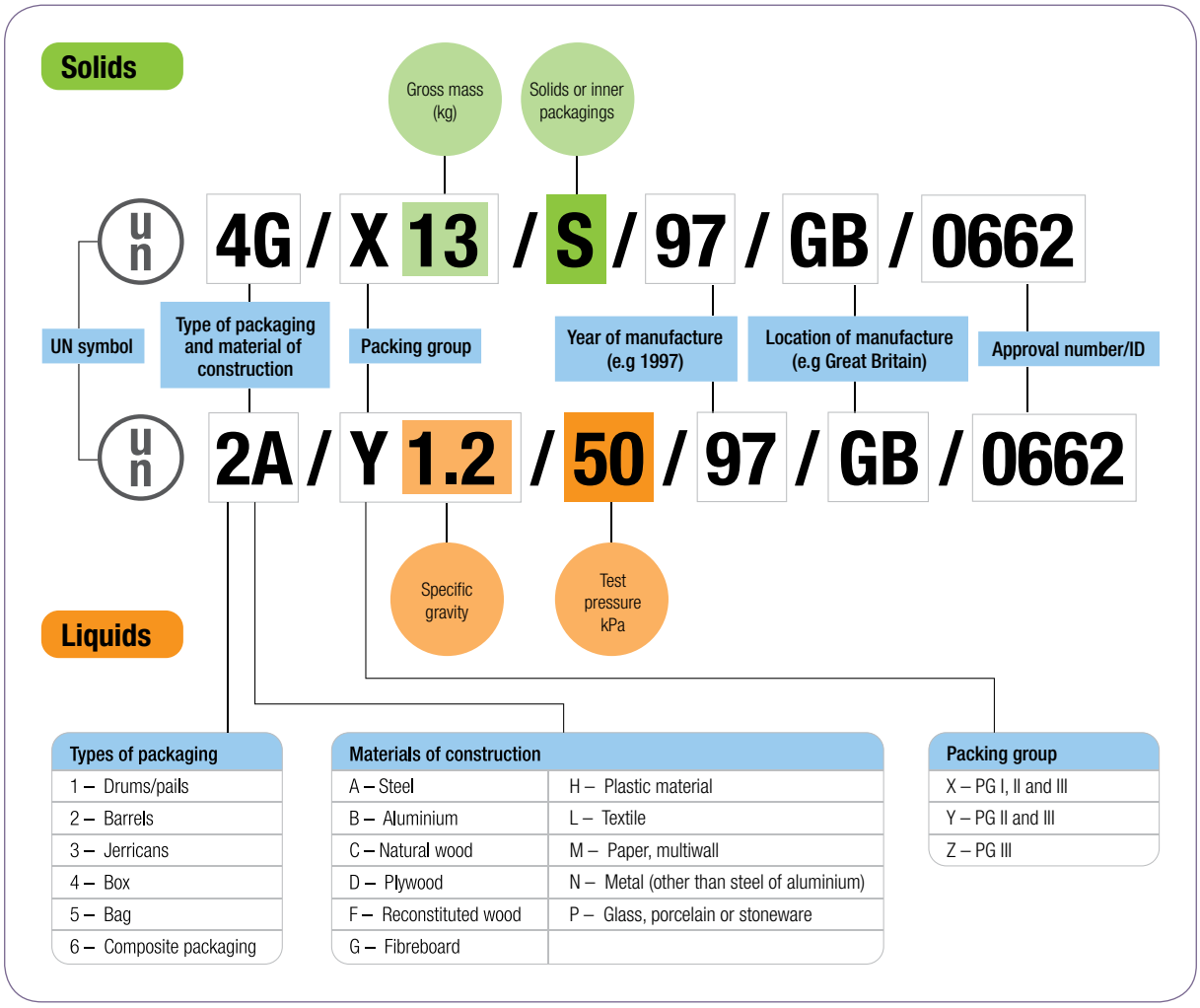
For information on dangerous good packaging requirements access the documents through the Department of Mines, Industry Regulation and Safety web page at www.dmirs.wa.gov.au

Beyond the gate – site responsibilities for transporting dangerous goods – pamphlet

Six pillars of dangerous goods transport – packaging – toolbox presentation

PACKAGING APPROVAL NUMBERS

Examples for solid and liquid dangerous goods



INJURY MANAGEMENT OF CONTRACTORS

The principal employers for mining operations are reminded that all duty of care obligations apply to contractors, including incident and injury management.

Where a principal employer contracts workers to work at a mine, the principal employer is deemed to be the employer in matters over which it has control [section 15A, *Mines Safety and Inspection Act 1994*].

Self-auditing by principal employers at several contractor-based operations has revealed a significant disconnect between the initial reporting of an injury to the principal employer and the subsequent follow-up by the principal employer with regard to appropriate classification, injury management and return-to-work processes.

Where injuries have not been followed up by the principal employer, consequences have included:

- termination of employees by the contractor following the injury event and before
  - medical treatment
  - commencement of an incident investigation
  - a workers' compensation application
  - completion of rehabilitation and return-to-work processes
- misreporting of the injury severity and associated lost time and/or alternate duties
- non-communication of injury status between the contractor and principal employer
- returning injured persons to non-meaningful work, or activities not aligned with their primary duties or treatment regime, with a consequence reduction in injury frequency rates.

SUMMARY OF HAZARD

Where injury management is dictated by frequency rates and statistics, injured persons are generally not appropriately managed, nor are controls suitably applied to prevent a recurrence.

If clusters and trends in accidents and incidents are not recognised as a result of poor reporting, the opportunity for management to address the root causes is lost. This can lead to hazards and their associated risks not being recognised or correctly identified, with hazardous conditions and situations continuing unchecked.

CONTRIBUTORY FACTORS

The following factors are common where contractor injury management deficits are identified.

- A lack of formal, documented systems specifying the responsibilities and accountabilities of the principal employer and contractor with regard to injury management (including communication processes).

- The contractor's injury management standard or procedure has not been assessed for general adequacy or conformity with the principal employer's safety management system.
- The ability of the contractor to appropriately manage injuries and follow relevant processes has been assumed, with no formal requirement to routinely communicate with the principal employer on injury status and progress.

RECOMMENDED ACTIONS

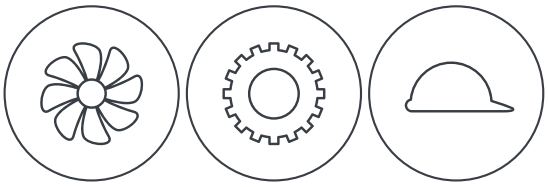
The following actions are recommended to principal employers when reviewing injury reporting and management systems, and can be applied to all elements of a safety management system (SMS).

- Confirm the adequacy of the mining operation's injury management processes and all critical aspects of the SMS.
- Assess the contractor's injury management processes and SMS against the mining operation's SMS.
- Following this assessment, determine whether gaps exist and confirm how these are to be addressed by the contractor and mining operation.
- Audit the incident and injury documentation of the mining operation and contractor and respond to deficits appropriately.

RESOURCES

More information is available on the Department's website **www.dmirs.wa.gov.au/ResourcesSafety**

- Why is reporting important? – webpage
- *Duty of care – labour hire industry – Mines Safety and Inspection Act pamphlet*
- *General duty of care in Western Australian mines – guideline*
- *General duty of care – employees and employers – Mines Safety and Inspection Act pamphlet*
- *Duty of care under the Mines Safety and Inspection Act 1994 – toolbox presentation*



WHAT'S IN THE AIR?

The supply of fresh air is essential for both the productivity and health of personnel. If harmful contaminants are present in air, the health effects can range from transient irritation to life-threatening conditions.

The importance of good air quality is reflected in numerous sections within the State's mines safety legislation. Exposure to airborne contaminants can cause serious health effects such as cancer, asthma, reproductive issues, kidney or liver damage, and neurological disturbances. These health effects are in addition to the well-known effects of particulates and fibres on the respiratory system, like asbestosis, pneumoconiosis and emphysema.

Extreme temperatures (hot or cold), lack of or excessive air movement, and excess humidity will affect the comfort and hence productivity of the workforce.

WHEN TO PROVIDE VENTILATION?

Ventilation is required whenever excesses of temperature or humidity may occur, atmospheric contaminants are present, or breathing air could be oxygen deficient.

When thinking of ventilation, it is important to consider surface facilities and not just underground mines. A competent person is essential during the design of new or modification to a processing plant to assess the need for ventilation and, if needed, its capacity and type. This includes any change in operating conditions (e.g. production rates, reagent or ore characteristics).

Ventilation is required when:

- contaminants are released from mineralised rocks due to extraction activities
- reagents used during processing or laboratory testing create harmful atmospheres – Mines Safety and Inspection Regulation 1995 regulation 9.30 requires that all vessels used for the chemical treatment of mineral substances at the mine be fitted with hoods or other devices to prevent harmful fumes, mists or vapours from entering the air breathed by employees
- contaminants become airborne during maintenance activities (e.g. dust disturbance, residual process fluids, welding, metal cutting, metal cleaning with various solvents).

VENTILATION SYSTEM SELECTION AND DESIGN

When determining ventilation requirements, use the hierarchy of control. The use of personal protective equipment (PPE), such as respirators, is no substitute for the safety-by-design approach involving established engineering controls.

Ventilation can be achieved through several methods, including general dilution ventilation or local extraction ventilation (LEV) to remove contaminated air from a specific location. The selection and design of appropriate and adequate ventilation depends on the atmospheric conditions and what is needed to achieve acceptable working conditions. Extraction is required for many situations in mineral processing operations, such as when contaminants with very low exposure standard levels or higher toxicity are present.

Hierarchy of control

EXPOSURE STANDARDS

Worker exposure to dusts, gases, mists and vapours should be maintained as low as reasonably practicable (ALARP). Every attempt should be made to keep exposures below the exposure standards recommended in the *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003 (1995)]. In practice, a working environment may contain a number of airborne contaminants and a synergic effect (i.e. how they work together) could cause increased health effects. This is why it is important to reduce the level of contaminants to ALARP to minimise the risk to health.

WHAT ARE EXPOSURE STANDARDS?

The exposure standards represent airborne concentrations of individual chemical substances that, according to current knowledge, if not exceeded, should neither impair the health of, nor cause undue discomfort to, nearly all workers.

The exposure standards do not represent 'no-effect' levels. In Australia, a time-weighted average (TWA) exposure standard refers to a concentration that most people can tolerate if they are exposed for an eight hour shift, for five days every week for their entire working life. It does not necessarily represent a safe level for everyone

COMMON SOURCES OF CONTAMINANTS

- Gold mineralisation may contain heavy metals (e.g. mercury), arsenopyrite (FeAsS), tellurides (AuTe2) and potentially fibrous minerals that can cause health issues at very low concentrations in the air.
- Iron ore mineralisation often contains fibrous minerals and silica. Some mining equipment cabins have mechanical ventilation to filter air and provide a positive cabin pressure to minimise dust ingress.

ASSESSING THE EFFECTIVENESS OF YOUR VENTILATION SYSTEM

Atmospheric contaminants should be monitored to evaluate hazards and to assess the effectiveness of control measures.

Mines are required to prepare a risk-based hygiene management plan (RBHMP) that provides an overview of the mine-specific occupational health hazards, monitoring programs and control measures. The design and implementation of a monitoring program should be carried out by, or in consultation with, a competent person.

Monitoring of the work environment involves the measurement of atmospheric contaminants at selected locations in the workplace (static, positional monitoring), as well as the biological monitoring of workers to determine the actual contaminants present in their bodies.

Where the atmospheric exposure of an employee is approaching the relevant exposure standard, or where biological monitoring indicates an unacceptable exposure, immediate action must be taken to reduce the health impact, and intensive monitoring should continue (refer to the Department's *Risk-based health surveillance and biological monitoring – guideline*).

Monitoring results should be recorded and employees informed of these results. The results should also be submitted to the Department.

MAINTENANCE OF MECHANICAL VENTILATION SYSTEMS

Any mechanical ventilation system including air-conditioning systems that provide fresh air should be regularly tested, cleaned and maintained to ensure they are providing sufficient clean air as designed. Refer to the supplier maintenance manual for specific information regarding the frequency of maintenance activities.

All maintenance activities should be recorded in the ventilation log book. Defects or malfunctions of ventilation systems must be repaired as soon as practicable to minimise workers' exposure to contaminants.

STRUCTURAL FAILURES DUE TO WIND AND OTHER INFREQUENT EVENTS

Buildings and structures can collapse when their strength is inadequate for the load applied. Constant and frequent loading, such as self-weight and thermal loads, happen slowly, whereas infrequent loads from events such as thunderstorms (including cyclones), mini-tornadoes, seismic activity, flood and fire can occur unexpectedly and act quickly.

Loading that happens regularly is at the forefront of our minds, but loading that rarely occurs can be easily forgotten – when was the last major storm you experienced? How many years ago was that? A building's ability to withstand wind can be taken for granted. What if the building you were in at the time was not strong enough?

If a building or structure collapses, it can result in injuries or fatalities. It is imperative that buildings and structures are designed and constructed to resist loads that may cause a failure leading to people being harmed.

Preventative measures can be taken to minimise exposure to harm, such as evacuating from site or into cyclone-rated buildings before a cyclone arrives.

Some existing buildings may not have the inherent safety features and robustness built into them to resist all loadings considered by modern design and construction standards. Assuming existing buildings are adequate because they have stood safely for years is no guarantee of future safety. Wear, corrosion, damage, fatigue and changed load conditions all contribute to an increased risk of collapse.

Mine Safety Bulletins Nos. 140 and *145* highlight the risk associated with wind acting on buildings and plant. *Mine Safety Bulletin No. 124* highlights the requirements of construction control and structural integrity assessment and management.

RESOURCES

Standards Australia, www.standards.org.au

- AS ISO 13822 *Basis for design of structures – Assessment of existing structures*
- ANSI/AISC 360 *Specification for structural steel buildings*
- AS 4100 *Steel Structures*
- AS1530 (All parts) *Methods for fire tests on building materials, components and structures*
- AS/NZS 1170 (All parts) *Structural design actions*

Department of Mines, Industry Regulation and Safety

- MSB No. 124 *Structural safety of buildings, plant and other structures*
- MSB No. 140 *Structural collapse of buildings and temporary structures during wind events*
- MSB No. 145 *Uncontrolled movement and derailment of fixed cranes during storm wind events*
- *Resources Safety Matters* Magazine, vol. 5 no 1 (March 2017)

available at **www.dmirs.wa.gov.au/ResourcesSafety**

MEASURES TO GUARD AGAINST COLLAPSE

Owners and managers of infrastructure can take preventative measures after assessing whether:

- plant and infrastructure has been designed and constructed to cater for all load conditions or natural occurrences. The following can be used to determine if these have been considered in the construction:
  - designer's specifications
  - as-built construction drawings
  - quality management documents
  - inspection documentation
- plant and infrastructure is being used and maintained as required by the designer and manufacturer
- the structure has been damaged (e.g. flood water damage to foundations, mechanical impact damage, corrosion of hold-down bolts).

If the above assessments find gaps in the design–construction–use lifecycle, undertake an assessment to establish what can be done to minimise risk.

Examples of gaps and measures to take for buildings include:

- inadequate strength for a sudden high wind – consider installing early warning measures and apply an evacuation plan as an interim control until the building is strengthened
- inadequate seismic resistance – consider retrofitting with damping devices or other measures as determined by competent persons
- inadequate fire resistance – consider applying fire load reduction programs and adding additional fire suppression systems.

IDENTIFIED STRUCTURAL MANAGEMENT DEFICIENCIES

Recent site inspections by the Department have identified a number of buildings and structures that pose a risk of collapse. It is imperative that all buildings and structures that may cause harm if they collapse remain in a serviceable condition. Prevent access to buildings that are dilapidated and at risk of collapse.

Issues identified include:

- areas of plant in use, but not structurally assessed by competent persons
- inadequate structural integrity assessments that do not assess a structure in accordance with original design nor identify all load-bearing components
- sites not correcting structural deficiencies identified in structural integrity assessments
- sites not identifying structural degradation such as corrosion, impact damage, modifications and cracking
- structures not competently designed or constructed
- project management plan submissions not addressing major risks associated with structures
- re-use of plant and structures without adequate assessment to confirm they are safe for use under altered loading conditions or at a new site
- steel structures with damaged corrosion protection covered by spillage, resulting in hidden corrosion weakening the structure
- concrete bases with impact damage or corroded reinforcing.

MANAGING ELECTRICAL RISKS

WHAT IS AN ELECTRICAL RISK?

An electrical risk is a risk of death, shock or other injury to a person caused directly or indirectly by electricity.

The primary electrical risk to humans is current in electrical circuits. The duration of the contact with electrical current is an important determinant of injury.

The risk of injury from electricity is strongly linked to where and how it is used. These risks are greatest in challenging operating environments such as mine sites where electrical equipment is exposed to moisture, heat, vibration, mechanical damage, corrosive chemicals and dust.

The main hazards associated with electrical risks are:

- contact with exposed live parts, where the electric shock may be received by direct or indirect contact, tracking through or across a medium, or by arcing
- electrical faults, which could cause fires
- electric shock, from step-and-touch potentials
- fire or explosion, where electricity could be the source of ignition in a potentially flammable or explosive atmosphere.

IMPACT OF ELECTRIC SHOCK ON THE BODY

During an electric shock, our nervous system, which functions by using electric current, is overwhelmed by an external current source entering the body. It can cause muscles to grip relentlessly, making it impossible for a person to release the faulty electrical equipment that is causing the electric shock, such as a power tool.

The relationship between the level of current and pathway of the current through the body (from the entry to the exit point) determines the number of organs that are affected and, as a result, the type and severity of the injury. The resulting health effects are also complicated by other factors, such as duration of contact with the current, body parts through which the current flows, skin wetness, gender and frequency.

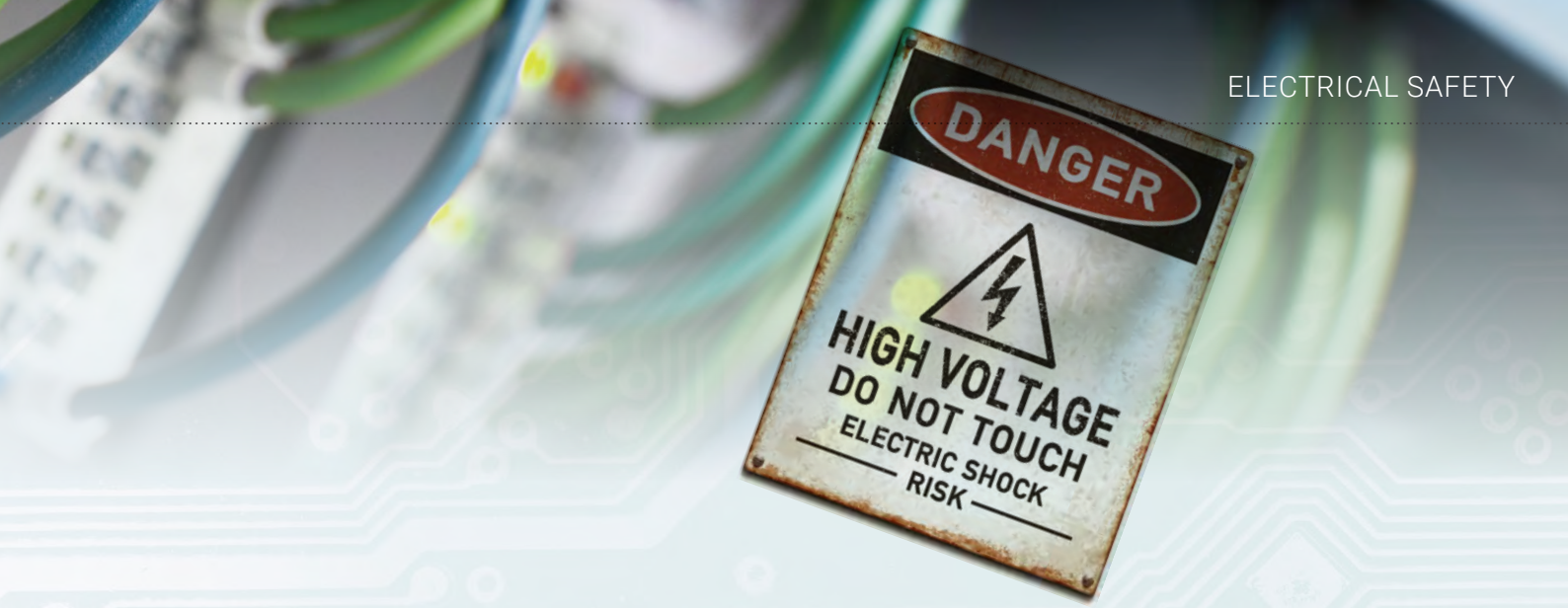
If the electric current passes through the heart, the heart muscles, which normally contract rhythmically, can be disrupted and begin convulsing in an ineffective manner, known as fibrillation. When in fibrillation, the heart no longer pumps blood through the normal distribution system. The fibrillating heart muscles fail to receive fresh oxygen, resulting in permanent damage. Other body muscles and the brain also fail to get the oxygen they need.

In some instances, current entering the chest causes the diaphragm to tense up, stopping respiration and leading to asphyxiation. Current flowing through one or more body parts can also cause the tissue temperature to rise rapidly, resulting in burning of the tissues.

WHY HAVE ELECTRICAL SUPERVISORS?

Electrical supervisors play an important role within a mining operation. They are not only responsible to the manager of the mine for electrical safety but are also responsible for meeting electrical regulatory obligations administered by the Department of Mines, Industry Regulation and Safety.

An electrical supervisor should be in a position to understand and be able to apply relevant legislation and standards as well as codes of practice, guidelines and company standards. They are responsible to the registered manager for electrical equipment at the mine and must be given adequate resources



to ensure they can meet legislative obligations and assist in the mitigation of electrical risk to as low as reasonably practicable (ALARP).

The principal employer or registered manager at a mine must appoint sufficient electrical supervisors to ensure adequate supervision for the safe installation, maintenance and testing of electrical equipment.

DUTIES OF AN ELECTRICAL SUPERVISOR

Eliminating the electrical hazards by isolating the electrical equipment is always the first strategy in electrical risk mitigation, but when it comes to the testing of electrical equipment, eliminating the hazard can sometimes be difficult or impractical (e.g. testing and fault finding programmable logic controllers or PLCs). Therefore, the risk must be treated to a tolerable level.

An electrical supervisor at a mine is responsible for:

- ensuring all work carried out in relation to electrical equipment and installations in their area of responsibility is adequately supervised (this includes understanding the competencies of the electrical workers that they are appointed to supervise and the complexity of electrical tasks that will be undertaken by those electrical workers)
- ensuring electrical equipment or installations in their area of responsibility are installed and tested in accordance with the Mines Safety and Inspection Regulations 1995 and maintained in a safe working condition
- ensuring electrical installations and equipment are in accordance with Australian Standard AS/NZS 3000 *Electrical installations* (also known as the Australian/New Zealand Wiring Rules)
- stopping the installation or use of any electrical equipment considered to be dangerous, in their area of responsibility, and reporting to the manager any situation that may affect the safe use of electricity or contravene the mines safety regulations
- regularly checking that the electrical nominee or electrical contractor has reviewed and inspected uncertified installations, and signed the electrical log book entries
- investigating, recording in the electrical log book, and reporting to the manager:
  - any electrical shock or burn received by a person
  - any fire suspected to be caused by electricity
  - any dangerous occurrence involving electricity that could have caused injury to a person.

INCIDENT NOTIFICATION

In the event of an incident or dangerous occurrence involving electricity, a district inspector must be notified before starting an investigation. The Department must also be notified [via online Safety Reporting System (SRS)].

It is also prudent to contact the Department's mines inspector (electrical) responsible for the mining operation so the inspector has an understanding of the incident before the notification is sent through SRS. For incidents not considered serious, this contact should be made during normal working hours.

The electrical supervisor is also required to:

- ensure an entry is made in the mine record book and electrical log book for all such incidents
- maintain the electrical log book and record in it all information required under Part 5 of the mines safety regulations
- regularly liaise with the manager of the mine on the status of all statutory matters within their area of responsibility.

AC/DC SHOCK

An electric shock caused by alternating current (AC) will produce greater injury than a shock caused by direct current (DC) of the same amperage because the DC causes a single muscle contraction that "throws" the victim away from the power source, thus minimising the injury.

This difference has a practical significance at low voltages, but at high voltages both the current types have similar effects.

BEWARE ARC FLASHING

Over the past six years, 18 workers in Western Australian mine operations received injuries from arc flash incidents – they required medical attention and lost time or placed on restricted duties.

This highlights the importance of being aware of arc flash hazards and the need to put controls in place. Controls include correct maintenance practices for electrical equipment and the adequate and effective supervision of electrical workers.

MAINTENANCE OF ELECTRICAL EQUIPMENT

The electrical supervisor's duties for maintaining electrical equipment include ensuring:

- maintenance systems are in place in their area of responsibility so that electrical equipment and installations are maintained in a safe working order — electrical supervisors must continually monitor the maintenance system to ensure it remains up to date
- electrical contractors have entered their work in section 1 of the area's electrical logbook and it has been certified
- each entry made in the electrical log book contains all details required by the Electricity (Licensing) Regulations 1991, including the name(s) of electrical worker(s), the contractor(s) that performed the work, and the date on which the work was completed
- the in-house licence nominee or electrical contractor has certified all entries in the electrical log book relating to new installations, as well as alterations and additions to existing installations, including when electrical installation works are removed or made redundant
- all electrical installation work is inspected and tested in accordance with the regulations.

UNSAFE POWER ADAPTORS DISTRIBUTED AT INDUSTRY FORUMS

An alert has been issued by two divisions of the Department of Mines, Industry Regulation and Safety to warn consumers of travel power adaptors supplied with electrical appliances purchased online or overseas that do not meet stringent Australian standards for product safety.

EnergySafety and Consumer Protection were prompted to issue the alert after two consumers received electric shocks from power adaptors supplied with electrical appliances purchased online.

CHECK YOUR POWER ADAPTORS

The unsafe power adaptors (see example below) have two exposed pins designed for use in the United Kingdom. When the power adaptor is plugged into a socket outlet, a consumer can potentially receive a fatal 240 V electric shock or serious injuries if they make contact with the pins, which remain "live". Even when locked in the recessed position, the pins are unsafe as it is still possible to make contact with them.

EnergySafety recently identified that about two hundred unsafe power adaptors were distributed at the Diggers and Dealers Mining Forum held in Kalgoorlie between 7 and 9 August 2017. Further investigation revealed about 1,400 units had also been distributed at similar mining events throughout Western Australia.

Forum attendees who received the power adaptors and have not yet been contacted by the supplier are urged to immediately return the product to the company or destroy and dispose of them.

SAFETY ADVICE

When purchasing a power adaptor, heed the following advice.

- Always buy power adaptors from local, reputable retailers.
- Only use power adaptors that are marked with the Australian approval number and the regulatory compliance mark to show that they meet Australian standards and are safe to use.
- Check the plug pins are configured for use in Australia and are insulated for at least 50 per cent of the pin length.

Consumers already in possession of an internationally purchased power adaptor are urged to have the product checked by a licensed electrician to ensure it is safe to use. If found unsafe, return the adaptor to the supplier or destroy and dispose of it immediately.

If you have purchased an unsafe adaptor in Australia or have identified any sold by a local retailer, please report it to *EnergySafety* on 6251 1900 or Consumer Protection on 1300 304 054.

Power adaptors that meet Australian standards and are safe to use will be marked with an Australian approval number and the regulatory compliance mark to show they comply with AS/NZS 3122 *Approval and test specification – Socket-outlet adaptors*.

NOTIFICATION OF ELECTION OF SAFETY AND HEALTH REPRESENTATIVES MOVING ONLINE

Safety and health representatives (SHReps) have an important role to perform in helping sites manage safety and health.

To assist industry in managing SHRep information, the Department will upgrade the Safety Regulation System (SRS) in early 2018 to allow sites to enter SHRep election details and track election terms and area(s) of responsibility online. This new functionality will replace the existing manual process.

The online approach will help sites to carry out their duties under the *Mines Safety and Inspection Act 1994* and manage their SHRep elections. Other benefits to industry include:

- SHReps being able to nominate their preferred contact details
- the ability to update details as they change
- automatic provision of supporting information to newly appointed SHReps
- training details to be included in SRS to help sites identify where introductory or refresher training is needed
- reminders sent via SRS to prompt sites that election terms are coming to a close
- SHRep details to be kept within SRS – unlike paper-based records they can't be misplaced or lost.

As part of the rollout of this new SHRep functionality, the Department will develop tools for industry such as training, SRS help videos, frequently asked questions and online help.

KEEPING YOUR SHREP IN THE LOOP

Implementation of the SRS enhancements for the notification of the election of SHREPs also provides the opportunity for the Department to communicate information directly to SHReps.

To assist with determining what information may be provided to SHReps, the Department surveyed registered managers at Western Australian mining operations to gauge the level of support for this engagement.

Feedback from the mine managers supports the plan to provide information such as notification prior to a site visit by inspectors, and follow-up correspondence including site visit records.

Implementation of this functionality will commence during 2018.

SHREPS AUDIT NOW AVAILABLE

A new audit is designed to assist mining operations with meeting their duties for the election, training, functions and duties of safety and health representatives. The audit was developed in 2016, and trialled with industry before being published on the Department website.

Feedback from audits conducted to date has been positive, with both employers and employees seeing the benefits of looking at the systems and processes related to engaging with SHReps. This has increased awareness of the roles of SHReps, and improved consultation and cooperation at several sites. One site has elected to develop its own handbook to assist SHReps in carrying out their roles.

The audits identified that SHReps need:

- time and resources to conduct incident investigations
- the opportunity to conduct inspections of their work area(s)
- access to consultative processes, such as safety and health committee meetings, to address safety and health issues raised.

The new audit supports the vital role of SHReps in contributing to safety at mines. Once trained in their role, they have an increased opportunity to assist management with mitigating hazards on-site as they are aware of compliance aspects as well as site processes, practices and hazards.

The SHRep audit is available online at **www.dmirs.wa.gov.au/ResourcesSafety**

RECOGNISING SHREP EXCELLENCE

Do you know a SHRep who has made an outstanding contribution to improvements in safety and health in your workplace?

Nominate them for the safety and health representative category in the 2018 Safety and Health Resources Sector Awards.

This award category recognises leadership in the workplace by an elected SHRep by introducing and driving a new approach or program to improve the safety, health and wellbeing of the workforce (e.g. training program, safety culture initiative, fitness for work program, mental health and wellness program or accident investigation method).

To register your interest for the Awards for Excellence, please send your contact details to **excellenceawards@dmirs.wa.gov.au**

SHOWCASING EMERGENCY RESPONSE EXCELLENCE AT LANGLEY PARK

In its biggest year to date, the annual Mining Emergency Response Competition (MERC) was held at Langley Park over the 25-26 November weekend.

With 15 teams, 120 volunteers and more than 60 sponsors from across the resources industry, MERC 2017 tested competing teams' skills in a series of realistic emergency response situations.

Over the two-day event, teams faced scenarios including firefighting, road crashes, vertical and confined space rescue, and handling hazardous materials. At the awards ceremony, Northern Star Jundee took out the title of best team, followed by AngloGold Ashanti and Synergy Muja Power Station.

Mines and Petroleum Minister, Bill Johnston, who opened the awards ceremony, emphasised the importance of teams being able to continue practising the techniques required to respond appropriately in the face of an emergency.

"MERC is a one-of-a-kind event that showcases the best of emergency response volunteers; it also develops their invaluable skills through competition," Mr Johnston said.

MERC highlights the skills involved to ensure safe workplaces and communities around Australia in the case of an emergency. It also provides the opportunity for mining families and the general public to get an insight into how these teams work in real-life emergency situations. Teams are made up of a combination of volunteer emergency response members and full-time emergency service officers.

Visit **www.themerc.com.au** for more information.

FMG Cloudbreak at the vertical rescue scenario TYC

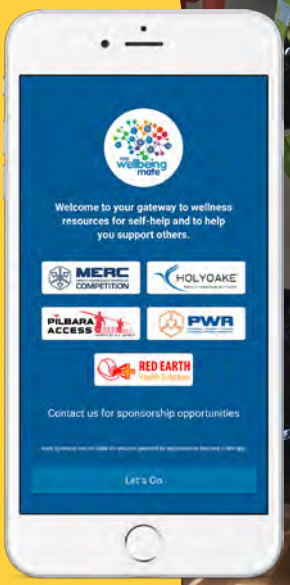
COMPETING TEAMS

AngloGold Ashanti
FMG Christmas Creek
FMG Cloudbreak
FMG Port Hedland
FMG Solomon
Karara Mining Ltd
Newmont Boddington Gold
Northern Star Jundee
Premier Coal
Rio Tinto Argyle Diamonds
Rio Tinto Dampier Salt
Rio Tinto Iron Ore Coastal
Rio Tinto Iron Ore East
Rio Tinto Iron Ore West
Synergy Muja Power Station

HONOUR BOARD

Best captain	Northern Star Jundee
Overall first aid	Northern Star Jundee
Best medic	Northern Star Jundee
Overall team safety	Northern Star Jundee
Overall breathing apparatus	AngloGold Ashanti (Sunrise Dam)
Road crash rescue scenario	Synergy Muja Power Station
Hazmat scenario	Synergy Muja Power Station and Northern Star Jundee
Vertical rescue scenario	FMG Cloudbreak
Fire fighting scenario	Rio Tinto Iron Ore Coastal
Confined space scenario	Northern Star Jundee
First aid scenario	Northern Star Jundee
ERT readiness scenario	AngloGold Ashanti (Sunrise Dam)

MERC PARTNERING WITH COMMUNITY



The competition takes the opportunity to give back to the community, each year raising vital funds for nominated charities. In 2017, MERC partnered with Holyoake to develop the *My Wellbeing Mate* app.

This innovative wellness app is an instant gateway to useful resources for self-help and to help support others. The app is available as a free download and is a valuable resource for emergency responders, employees of resources companies and their families, and anyone in the wider community.

For more information on the 'My Wellbeing Mate' app, visit **www.themerc.com.au**

Rio Tinto Iron Ore West in confined space scenario SH

SINGAPORE ACCORD SIGNED

The Singaporean Ministry of Manpower hosted the XXI World Congress on Safety and Health at Work 2017 (World Congress 2017) in Singapore, from 3 to 6 September.

Supported by the International Labour Organization and the International Social Security Association, the World Congress is held triennially in regions around the globe, and provides a platform for the exchange of information and views from industry and worker representatives, government agencies and experts in the field of occupational safety and health.

The World Congress 2017 heralded a new era for the global safety community with the declaration of the Singapore Accord (the accord).

Forty-eight organisations signed onto the accord, demonstrating their commitment to improving occupational health and safety (OHS) professional and practitioner capabilities to help create healthier and safer workplaces.

Each signatory organisation has committed to implementing the INSHPO framework to develop a network of competent and capable professionals and practitioners, and improve global OHS performance.

President of the American Society of Safety Engineers, Jim Smith, whose organisation represents more than 37,000 OHS professionals, was one of the accord signatories.

"This is one of the most significant initiatives produced on the international stage by the OHS profession," Mr Smith said.

"For the first time, we have achieved a common global commitment to defining capabilities for OHS professionals and practitioners, which in turn will raise competencies and ultimately lead to fewer worker injuries, illnesses, and fatalities."

For more information on the INSHPO framework, visit www.inshpo.org

WHAT IS THE INSHPO GLOBAL FRAMEWORK FOR OSH PRACTICE?

The International Network of Safety and Health Practitioner Organisations (INSHPO) developed a consensus-based definition of international standards required for the role, functions and competencies for OHS professionals and practitioners.

Over a six-year period, drafts of the standards were analysed by safety specialists from a variety of industries around the world and were enhanced through practical application by the International Council on Mining and Metals.

The work has led to the publication of The Occupational Health and Safety Professional Capability Framework: A Global Framework for Practice, by INSHPO (INSHPO framework).

The INSHPO framework can be found on the INSHPO website at **www.inshpo.org/work**

MINES SAFETY

$65,000 FINE FOR 2011 ARC FLASH INCIDENT

[sentenced October 2017]

FQM Australia Nickel Pty Ltd has been fined $65,000 in the Perth Magistrates Court after a worker was injured in an electrical arc flash at the company's Ravensthorpe Nickel Operations.

Shane Russell, employed as an electrician on the site, was working inside an electrical substation on 29 July 2011 when there was an arc flash.

Mr Russell's co-workers heard a yell, followed by a bang, from the area he was working in and went to his aid.

Mr Russell sustained burns to his left hand and the left side of his face as the result of the arc flash. He underwent medical treatment and was hospitalised, but did not suffer any permanent injuries.

An investigation by the Department of Mines, Industry Regulation and Safety found an internal report by FQM into a previous incident four months earlier had identified the danger of working on the motor control centre (MCC) without full isolation.

There was no hard barricade behind the isolator to prevent accidental contact with uninsulated live bus bars.

The potential consequence of an arc flash re-occurrence was identified as being "major" and the likelihood was "possible".

It recommended that the MCC be fully isolated prior to working on the module, and a hard barricade be installed to prevent accidental contact with the live bus bars.

Mines Safety Director, Andrew Chaplyn, said an arc flash can cause severe burns and even death to workers nearby.

"This was a preventable incident and had the potential to be fatal," Mr Chaplyn said.

"It is critical that companies immediately implement actions recommended from previous incidents and ensure there are effective controls in place.

"The dangers of an arc flash and electrocution are well known, as are the control measures that should be taken to avoid them."

Western Australia's electrical safety regulator, *EnergySafety*, is in the process of amending legislation to ban electrical work on energised electrical equipment.

This will include electrical work undertaken on mine sites. It is expected the proposed changes will come into effect later in 2018.

$65,000 FINE FOR NEAR MISS IN 2015

[August 2017]

Mincor Operations Pty Ltd has been fined $65,000 in the Kalgoorlie Magistrates Court for an incident that occurred at its Miitel Nickel Mine in the Goldfields.

On 2 April 2015 a surveyor was reversing a four-wheel drive vehicle down an underground access drive when he accidently reversed the rear wheels over the edge of a 19-metre deep open stope.

The surveyor braked in time to avoid falling into the stope and was rescued from the vehicle by his co-workers after radioing for help.

The surveyor was on his way to conduct a cavity monitoring survey and was looking for an 'open stope below' sign which he believed to be 30 to 50 metres away from the edge of the open stope.

He intended to stop his vehicle at this sign and set up the surveying equipment.

An investigation by inspectors from the Department of Mines, Industry Regulation and Safety found there was no safe work procedure in place for workers conducting surveys, inadequate instructions on signage within single-entrance headings and no physical barricade protecting workers from the open stope.

Mines Safety Director, Andrew Chaplyn, said a stope with a drop of 19 metres created an obvious hazard and presented a risk of serious injury or death.

"There were a number of practicable steps the company could have taken to avoid the surveyor being exposed to that hazard," Mr Chaplyn said.

"This included installing a physical barrier at the edge of the stope and ensuring adequate signage was in place.

"In addition, there was no safe work procedure in place for surveyors conducting a survey in an underground access tunnel."

Mr Chaplyn said the case highlighted the importance of companies ensuring they have established and adequate safety systems in place, and that these systems are applied.

"This could quite easily have been a fatal incident and the means to prevent it could have been implemented at relatively small cost or inconvenience to the company," Mr Chaplyn said.

In handing down the penalty, the court took into account the company's early guilty plea and cooperation with investigators.

HOW ARE WE TRACKING?

WESTERN AUSTRALIA'S SAFETY PERFORMANCE

The fatality data for Western Australia's resources sector is presented as the number of fatalities and fatal incidence rate (injuries per 1,000 employees).

Because the number of fatalities can vary considerably from year to year, Safe Work Australia is measuring progress towards the national target for worker fatalities due to injury using a three-year rolling average. This guards against an unusually low number of fatalities in 2022 meeting the target by chance rather than by sustained improvement.

The Western Australian fatality data for mining and exploration is also presented as a three-year rolling average for the number of fatalities. To account for changes in total workforce, the same reduction target is shown for the three-year rolling average fatal incidence rate.

Safe Work Australia's targets for injuries, including musculoskeletal disorders, relate to compensation claims. Serious claims are defined as those where the worker has been off work for one or more working weeks. This differs from the definition used for reporting serious mining and exploration injuries to Resources Safety. However, for consistency, injury reports for mining and exploration fitting the Safe Work Australia definition have been extracted and the same targets applied to injury incidence rates.

The injury reporting requirements for petroleum facilities do not allow a similar data treatment.

Note: Safe Work Australia presents the national data in calendar years, with the targets applying from 2012 to 2022. The safety performance data for mining and exploration in Western Australia is reported for financial years and hence the Safe Work Australia targets are applied from 2011-12 to 2022-23.

NATIONAL TARGETS

The *Australian Work Health and Safety Strategy 2012–2022* was launched by Safe Work Australia in October 2012. There are three specific targets to be achieved by 2022:

1. 20 percent or greater reduction in the number of worker fatalities due to injury
2. 30 percent or greater reduction in the incidence rate of workers' compensation claims where the worker has been off work for one or more working weeks
3. 30 percent or greater reduction in the incidence rate of workers' compensation claims for musculoskeletal disorders where the worker has been off work for one or more working weeks.

Further information on the *Australian Work Health and Safety Strategy 2012-2022* is available on Safe Work Australia's website.

- *Australian Work Health and Safety Strategy 2012-2022*
- Measuring progress towards targets

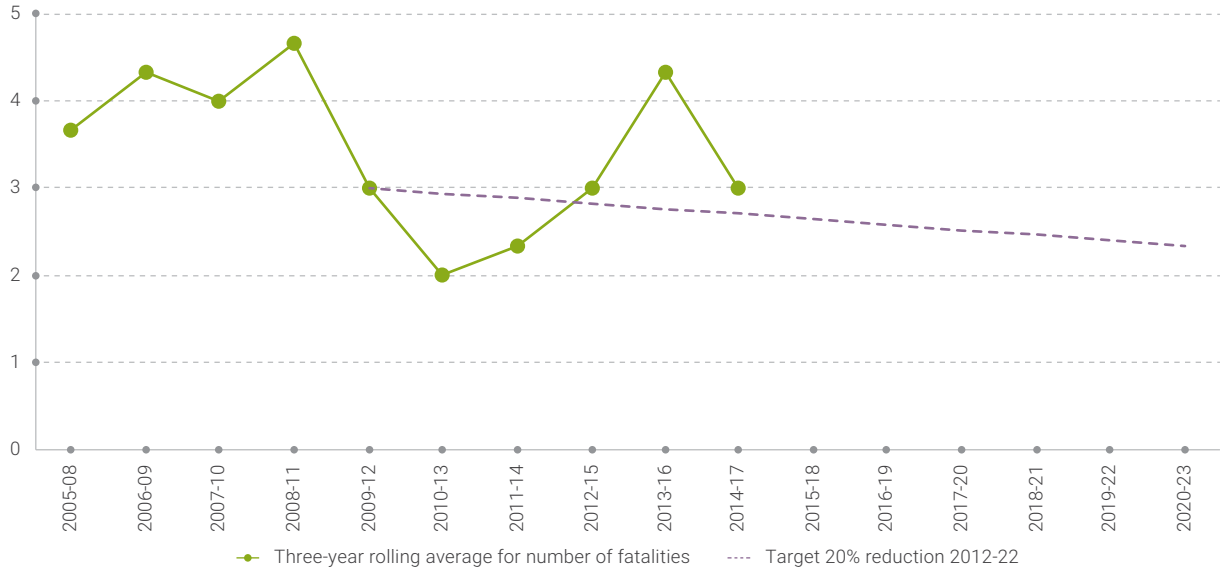


Figure 1 *Three-year rolling average for number of fatalities over the past 10 years (the number of fatalities per 1,000 employees). The dotted line indicates what a 20 per cent decrease would look like from 2012 to 2022 as per the Safe Work Australia target. The three-year rolling average is used because of the considerable variation in numbers for fatalities from year to year.*

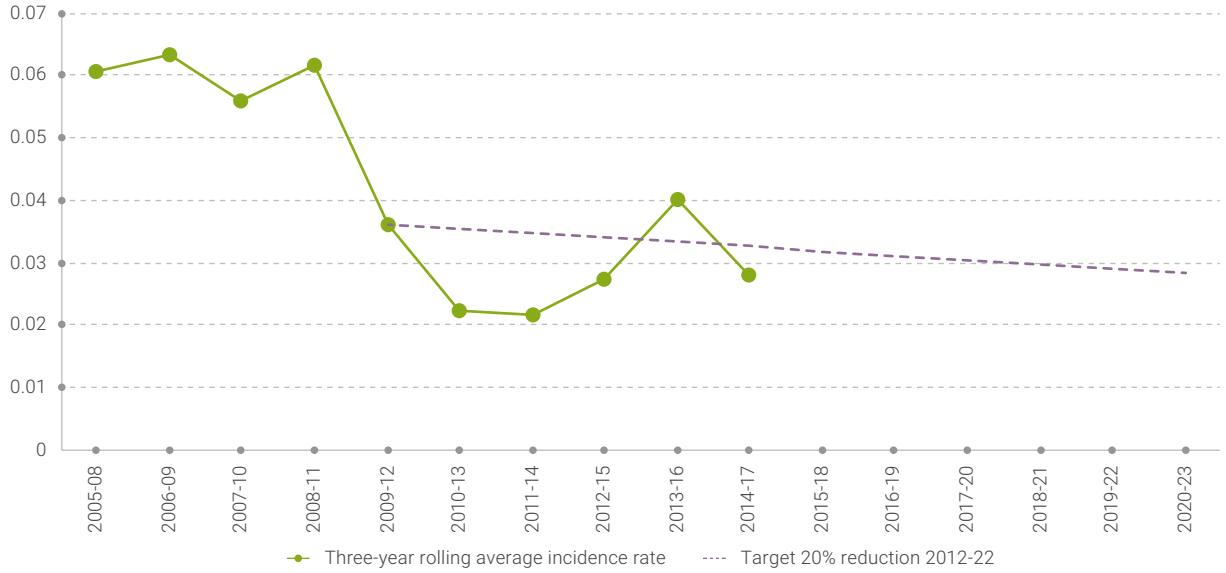


Figure 2 *Three-year rolling average of incidence rates for fatalities over the past 10 years (the number of fatalities per 1000 employees). The dotted line indicates what a 20 per cent decrease would look like from 2012 to 2022 as per the Safe Work Australia target.*

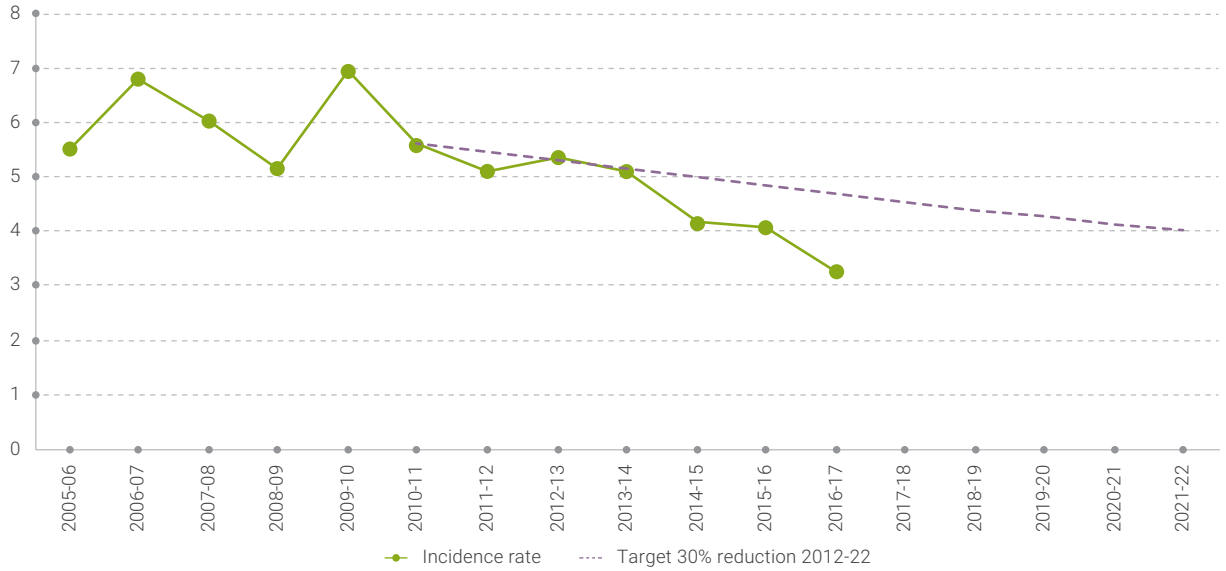


Figure 3 *Incidence rate for musculoskeletal injuries of one week or more duration over the past 10 years (the number of musculoskeletal injuries per 1000 employees). The dotted line indicates what a 30 per cent decrease would look like from 2012 to 2022 as per the Safe Work Australia target.*

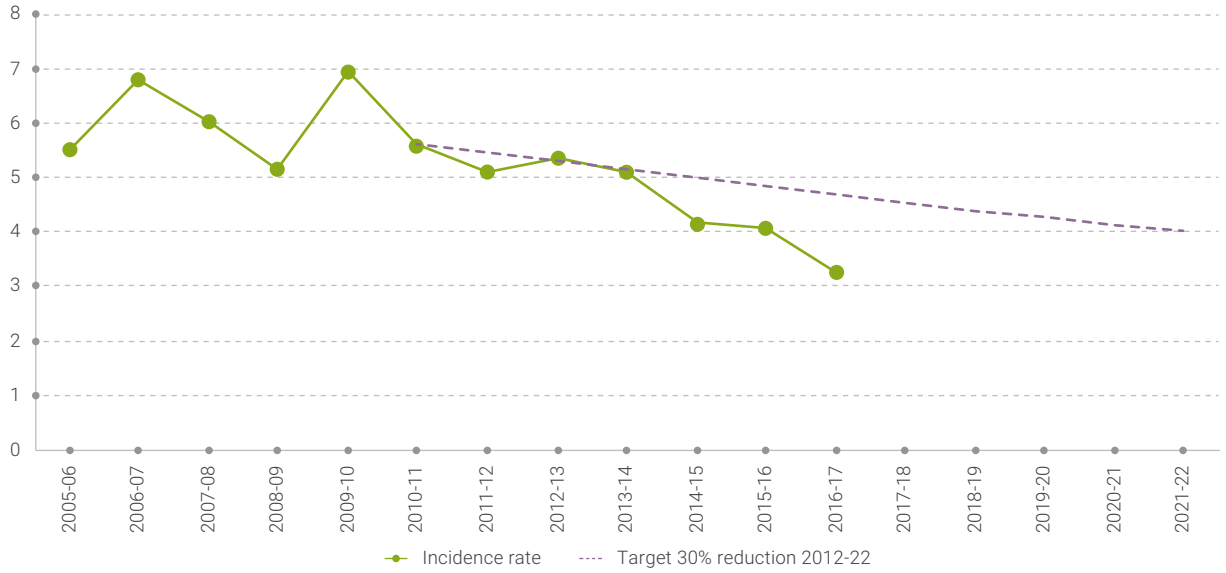
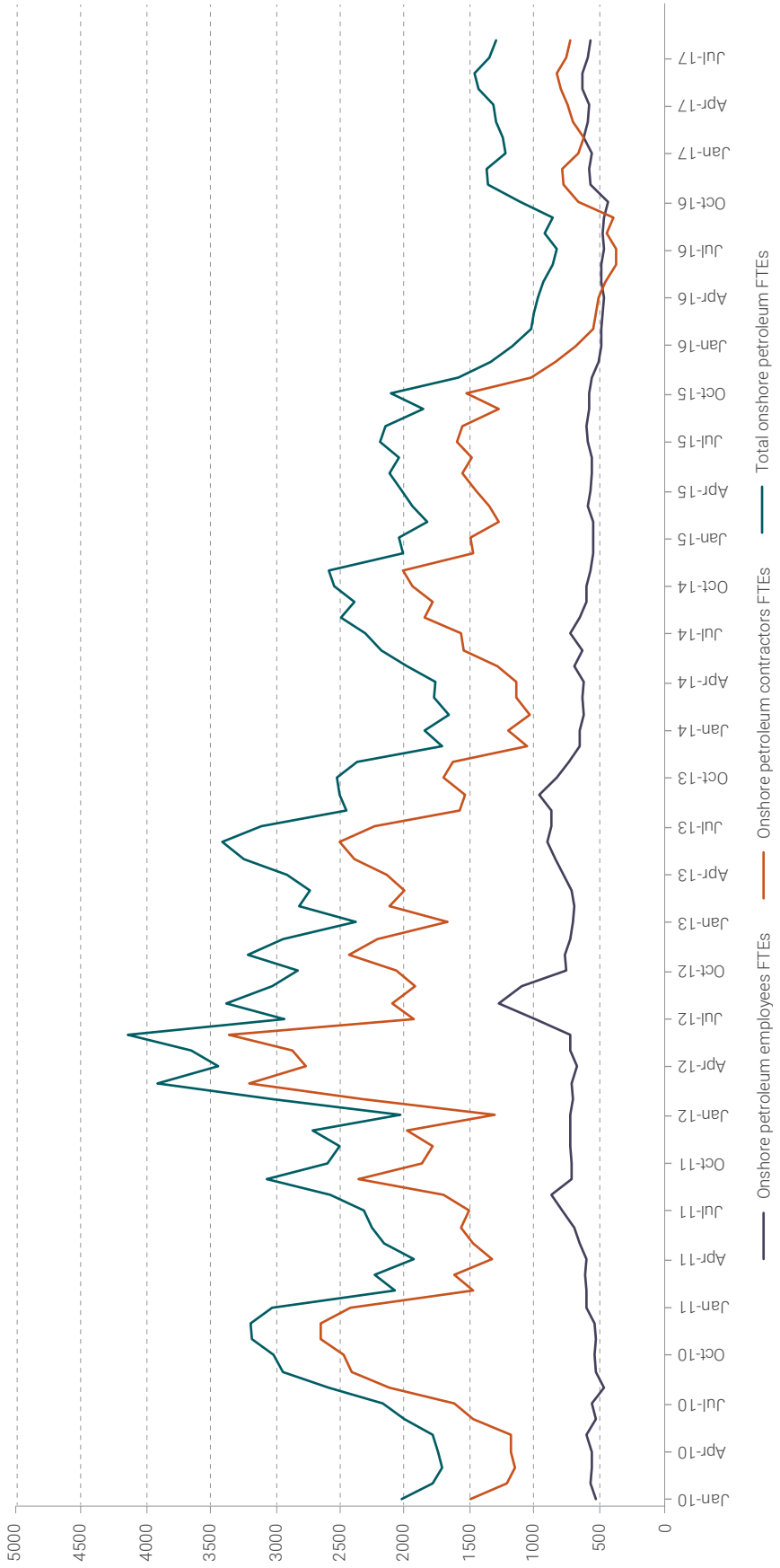


Figure 4 *Incidence rate of total injuries resulting in one or more weeks off work, over the past 10 years (the number of total injuries per 1000 employees). The dotted line indicates what a 30 per cent decrease would look like from 2012 to 2022 as per the Safe Work Australia target.*

Note: Total injuries refers to lost time injuries resulting in one or more weeks away from work and restricted work injuries resulting in one or more weeks away from regular duties.

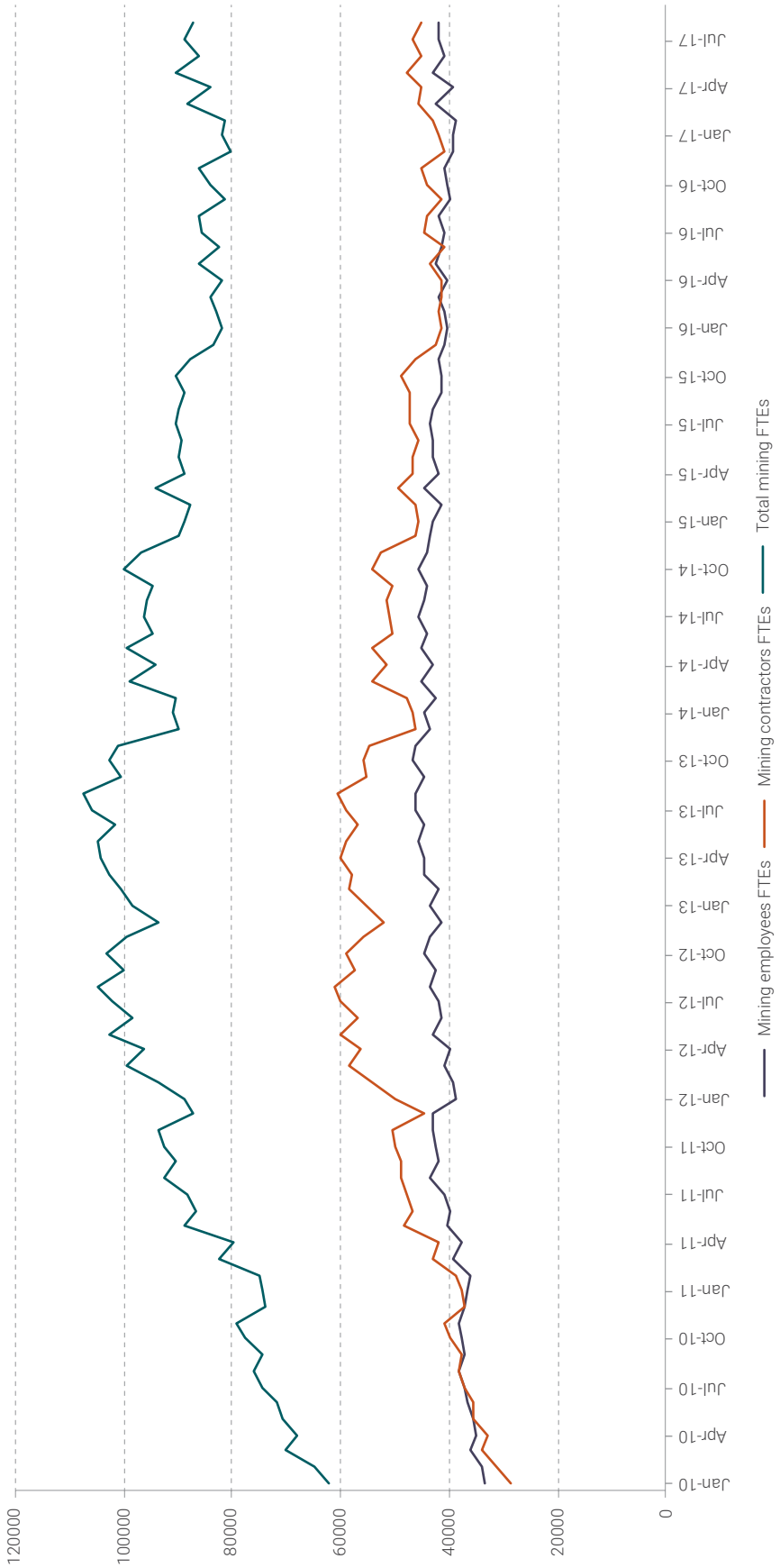
WA'S MONTHLY ONSHORE PETROLEUM WORKFORCE (AUGUST 2017)

Note: Monthly petroleum workforce figures reported as hours but plotted as full-time equivalent (FTE), where 1 FTE = 2,000 hours worked per year

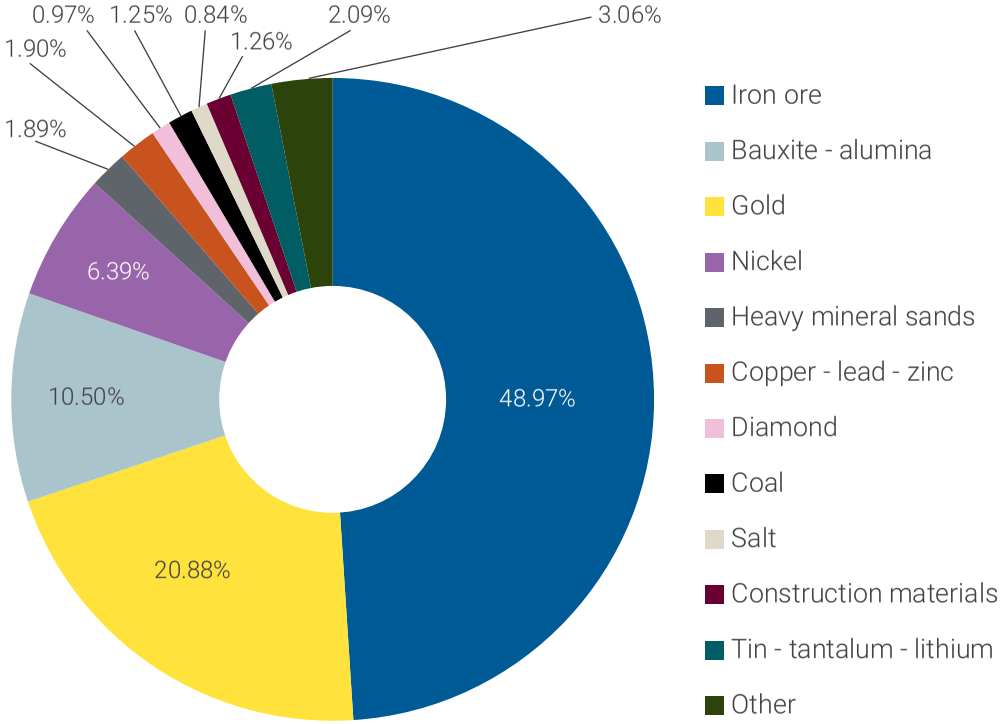


WA'S MONTHLY MINING WORKFORCE (AUGUST 2017)

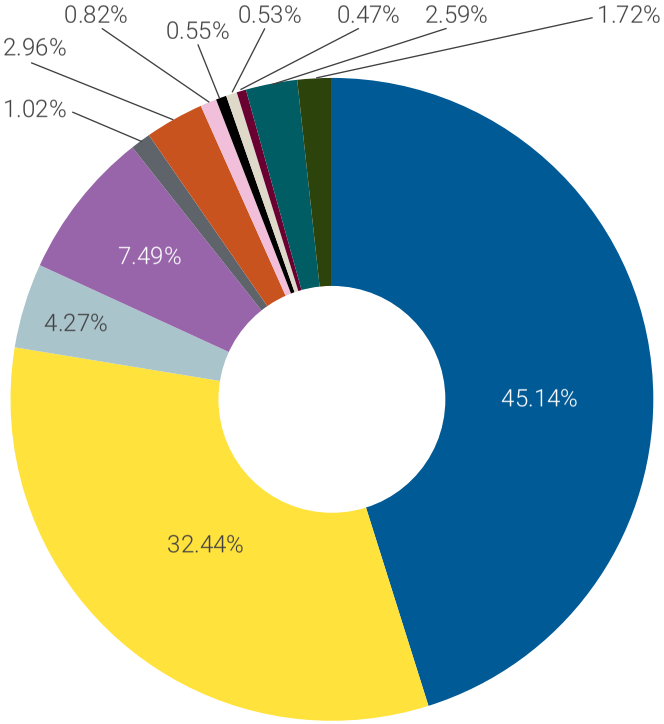
Note: From 1 July 2009, monthly mining workforce figures are plotted as full-time equivalent (FTE), where 1 FTE = 2,000 hours worked per year



WA'S MINING WORKFORCE – PERCENTAGE BY COMMODITY (AUGUST 2017)



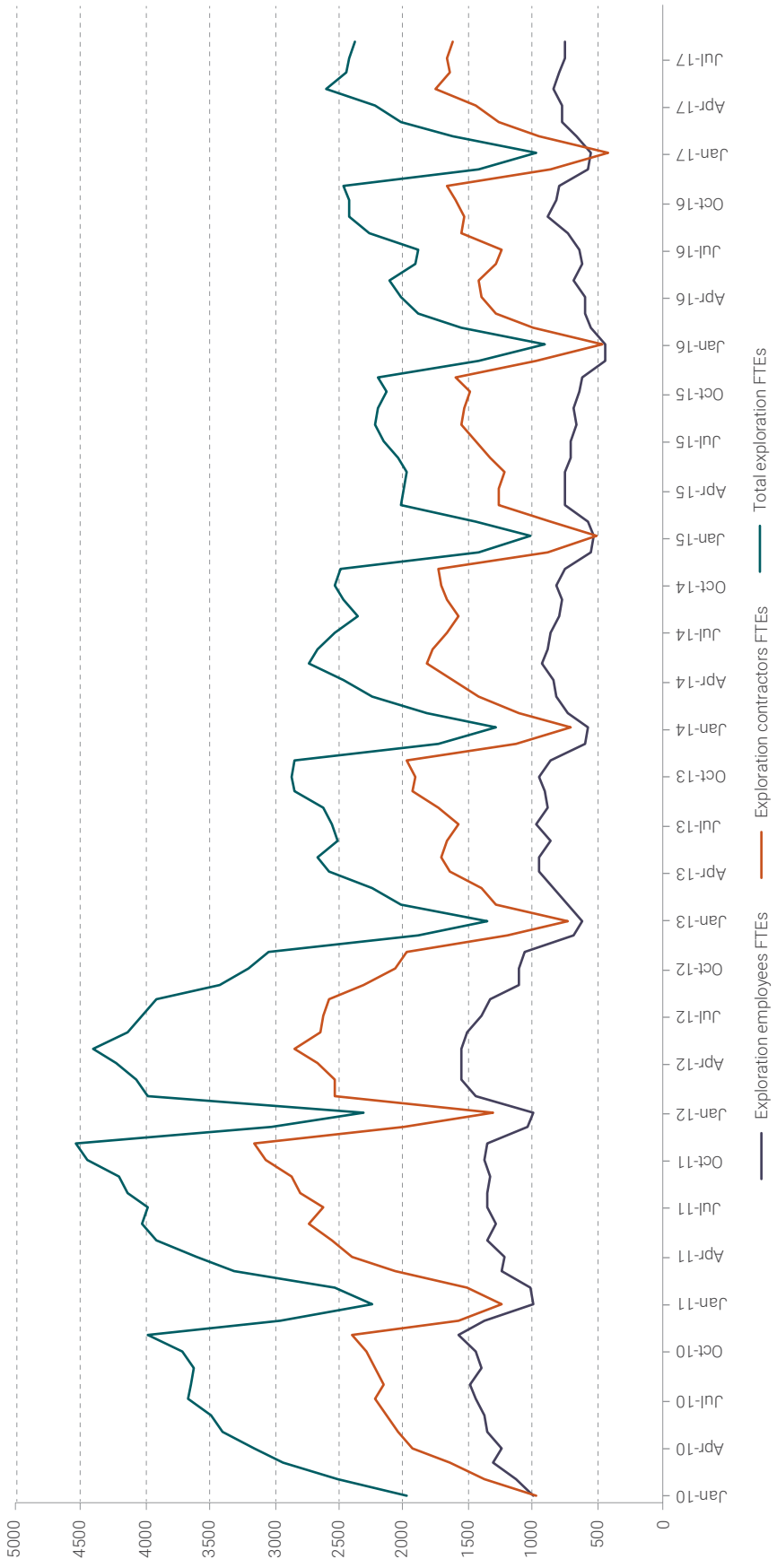
Mining employees FTEs



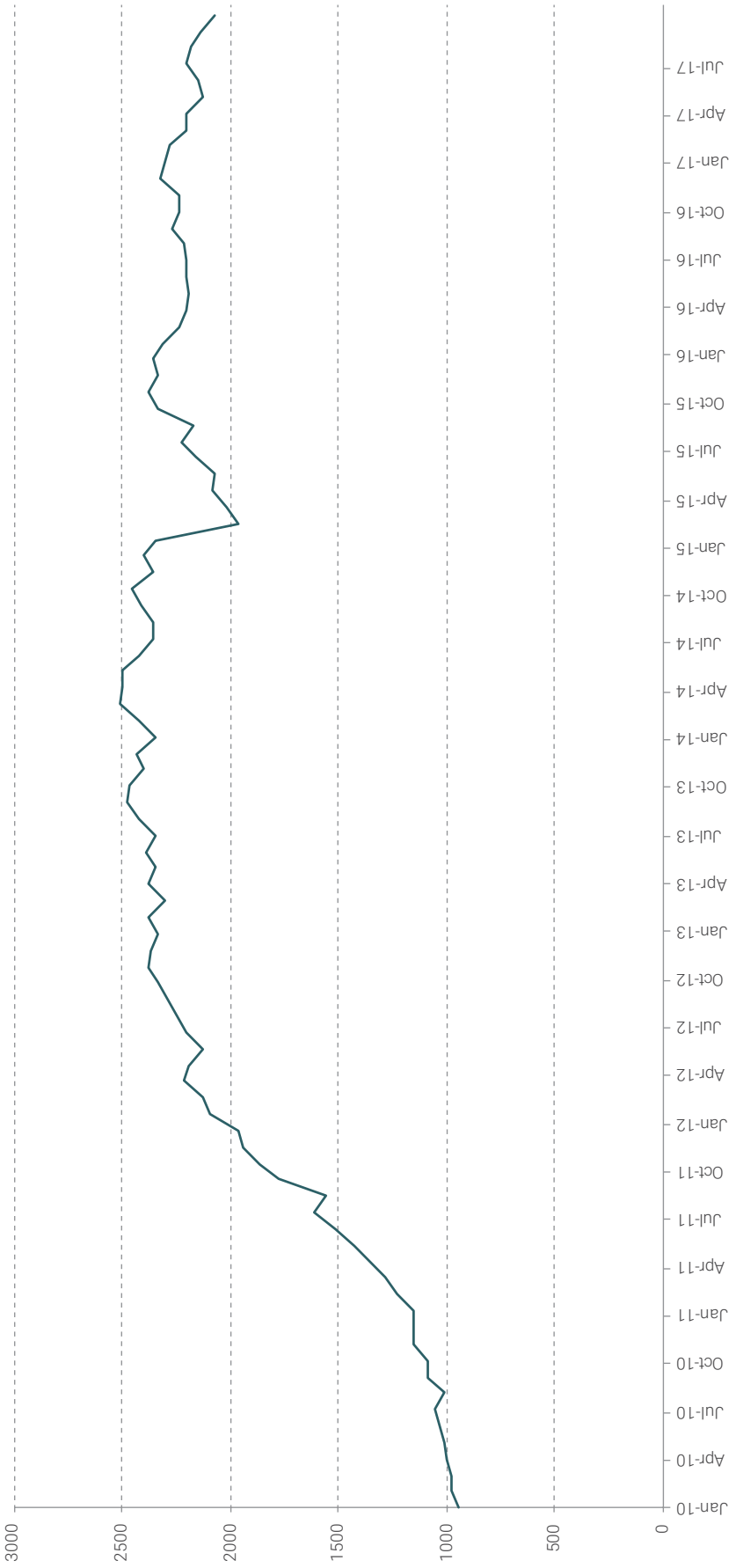
Mining contractors FTEs

WA'S MONTHLY MINERAL EXPLORATION WORKFORCE (AUGUST 2017)

Note: From 1 July 2009, monthly mining workforce figures are plotted as full-time equivalent (FTE), where 1 FTE = 2,000 hours worked per year



NUMBER OF ELECTED SAFETY AND HEALTH REPRESENTATIVES FOR WA MINING (AUGUST 2017)



MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **254**

UNCONTROLLED RELEASE OF ENERGY DURING REMOVAL OF LUFFING CYLINDER PIN

ISSUED: 6 JULY 2017

Summary of incident

In October 2016, specialist contractors were attempting to remove a trunnion pin from a reclaimer's luffing cylinder using a purpose-built, hydraulically powered extraction implement.

Note: The extraction implement consisted of a hydraulic cylinder that pulled on an end plate, which in turn pulled on the reclaimer's trunnion pin via a threaded rod.

Removing the trunnion pin was difficult and there were several attempts to extract the pin. On each attempt the pulling action of the extraction implement was increased.

Note: The maximum pressure applied was reported to be 90 per cent of the hydraulic system's capacity.

After the fifth attempt the threaded rod failed unexpectedly, releasing stored energy. The rod and end plate were ejected from the work area (on an elevated maintenance platform of the reclaimer). The end plate missed an operating crane and was found about 20 metres away on the ground.

Further investigation identified that the threaded rod had failed due to tensile overstress.

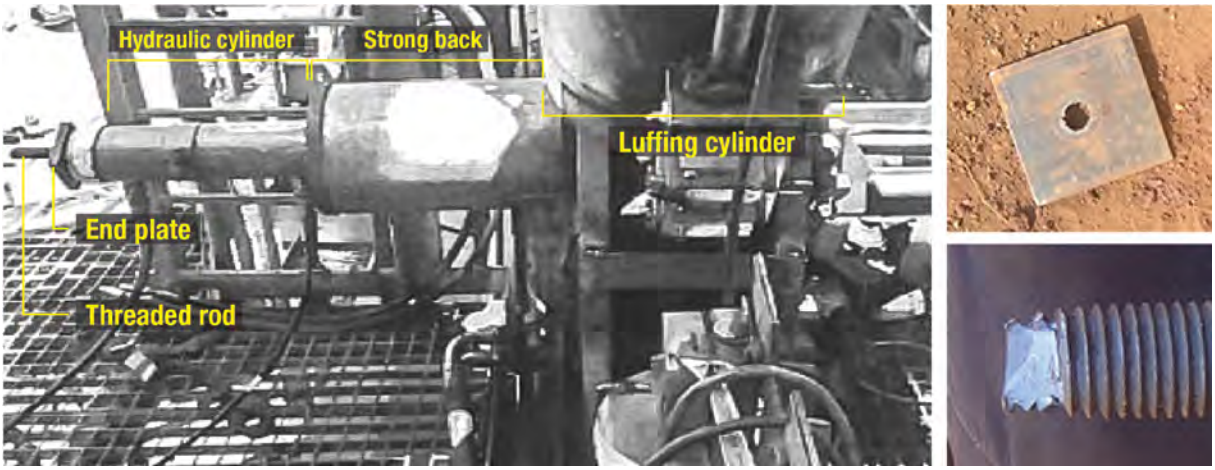
Probable causes

Direct

- The load applied by the hydraulic system exceeded the tensile capacity of the threaded rod.

Contributory

- No safe operating limits were specified in the safe work procedure or job hazard assessment.
- There was inadequate safety-in-design consideration for the implement as the hydraulic system was capable of exceeding the breaking capacity of the threaded rod.
- Engineered protection devices (e.g. pressure relief device) were not designed or installed correctly to protect the system from inadvertent overloading.



Left. Picture from the specialist contractor's safe work procedure illustrating the set-up of the implement. Right. Ejected end plate (top) and failed threaded rod (below).

- The controls for the safe use of the implement were not identified as inadequate in the risk assessment process.

  Note: The specialist contractor had previously carried out similar tasks using similar equipment for the mining operation.
- The threaded rod was not adequately rated or assessed by a competent person.

  Note: No detail drawings could be provided at the time of the investigation. Also, the site's supervisory team assessment of the capacity of the threaded rod was incorrect.

Actions required

- Use competent person(s) to design and load rate all purpose-built mechanical tools or implements.
- Consider using engineering controls to mitigate the risk of overloading of mechanical systems (e.g. load limiting devices such as pressure control valves).
- Identify and document the operating limit or capacity of the purpose-built mechanical tool, in a safe work or operating procedure.

  Note: The operating limit should be based on the published capacity of the components of the tool, determined using sound engineering principles, or have its upper limit tested in a safe environment.
- Consult the original equipment manufacturer (OEM) of the plant when developing special tools and work procedures to perform maintenance on that plant.
- If the tool's procedure does not work as intended, communicate with the OEM of the plant, or supplier of the purpose-built mechanical tool.
- Adequately train, and verify as competent, personnel using specialised tooling.

Further information

- Department of Mines and Petroleum, Mining safety publications, **www.dmp.wa.gov.au/Safety/Mining-Safety-publications-16162.aspx**
  - Significant Incident Report No. 208 *Bystander struck by component ejected from accumulator*
  - Significant Incident Report No. 169 *Suspension component ejected under high pressure during maintenance – fatal accident*

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **255**

TELEHANDLER ROLLOVER DURING A LIFT

ISSUED: 10 NOVEMBER 2017

Summary of incident

Note: The Department of Mines, Industry Regulation and Safety's investigation is ongoing. The information contained in this significant incident report is based on materials received, knowledge and understanding at the time of writing.

In January 2017, a telehandler was being used to lift a pipe assembly at a tailings storage facility. A worker had attached the first leg – a single roundsling rated to three tonnes – to a knife gate valve while the other end was choked around the tool carrier frame. A second leg – comprising two connected two tonne-rated roundslings – was attached to a branch of the pipe assembly. This was then secured to a shackle placed through a hole in the tool carrier frame.

As the load was lifted, the three tonne-rated roundsling broke and the telehandler fell on its side. The worker was standing near the telehandler when it hit the ground.

Probable causes

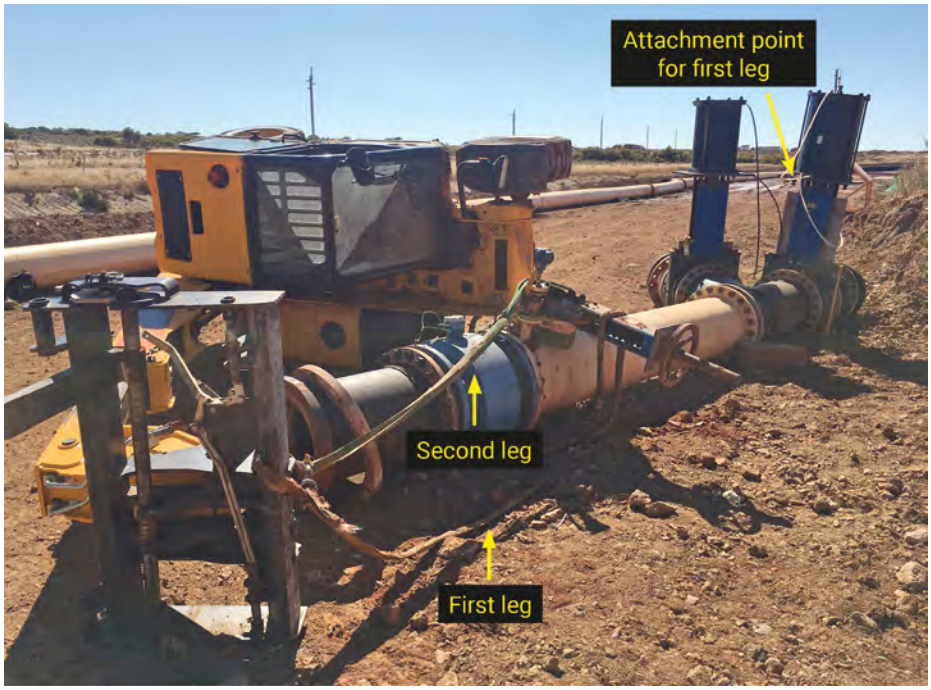
Direct

- The three tonne-rated roundsling failed.

  Note: The sling had been damaged prior to the incident when it was used to drag a section of pipe over hard and rocky ground.

Contributory

- The three tonne-rated roundsling initially took more of the load when the pipe assembly was lifted.



Final position of telehandler and pipe assembly showing the lifting arrangement

- The weight of the pipe assembly (over 3 tonnes) was greater than the maximum-rated lifting capacity of the telehandler (2.5 tonnes).
- The work required the use of slinging techniques for the purposes of lifting a load, for which a dogging high risk work licence is the minimum requirement. The worker that slung the load did not have an applicable high risk work licence.
- The telehandler operator had a high risk work licence and had been assessed as competent for using the tynes on the telehandler, but had not been assessed as competent for lifting freely suspended loads.
- The roundsling that failed was attached to an unrated lifting point on the knife gate valve and was choked around the tool carrier frame which had sharp edges.

Actions required

Verification of competency

Responsible persons are reminded that under the Mines Safety and Inspection Regulations 1995, the following is required.

- A person (e.g. dogman, rigger) must not do high risk work of a particular class at a mine unless they hold a high risk work licence for that class of work [r. 6.37 (1A)(a)].
- Before commencing work at a mine every worker must be assessed to verify they are competent to perform the tasks they are assigned, and to operate any plant or equipment they are required to operate [r. 4.13 (1)(b)]. This includes the assessment of telehandler operators, doggers and riggers working at the mine.

Safe systems of work

- Conduct an adequate risk assessment of the task before lifting the load that includes:
  - assessing the load as accurately as possible using pipe and equipment specifications and using the skills of a competent person to calculate the weight of the load
  - using fit-for-purpose plant (e.g. cranes, multi-tool carriers) that have a maximum rated lifting capacity capable of safely lifting the load
  - using fit-for-purpose lifting equipment that has a working load limit (WLL) capable of safely lifting the load.
- When lifting a pipe assembly, consider separating it into smaller parts which can be safely lifted with telehandler attachments approved by the original equipment manufacturer.

Roundsling management

- All slings must be inspected before each lift by a competent dogger or rigger, and if there are any visible cuts or damage to the sleeve or protective coating, the sling must be discarded.
- Do not drag a load that is slung, nor allow a sling to be dragged over the ground or over rough surfaces.
- Use protective sleeves or corner pieces to protect the sling from sharp edges.
- Loads must be slung so they are balanced and stable and cannot topple or fall out during the lift.

Further information

- Standards Australia, www.standards.org.au
  AS 4497.2 *Roundslings – Synthetic fibre – Care and use*
- Department of Mines, Industry Regulation and Safety
  High risk work licence training and verification of competency, www.dmp.wa.gov.au/Safety/High-risk-work-licence-training-20550.aspx

  Hazard awareness videos, *Raising the issue*, www.dmp.wa.gov.au/Safety/Hazard-awareness-videos-16435.aspx

  Licensing requirements for industrial lift truck, forklift truck and multi-purpose tool carriers, www.commerce.wa.gov.au/sites/default/files/atoms/files/multipurpose_machine.pdf

  Dogging licence: Applying slinging techniques and the use of judgement, www.commerce.wa.gov.au/publications/dogging-licence-applying-slinging-techniques-and-use-judgement

MINES SAFETY SIGNIFICANT INCIDENT REPORT NO. **256**

PROCESS TANK ROOF BURSTS DUE TO UNCONTROLLED REACTION

ISSUED: 21 NOVEMBER 2017

Summary of incident

Note: The Department of Mines, Industry Regulation and Safety's investigation is ongoing. The information contained in this significant incident report is based on materials received, knowledge and understanding at the time of writing.

In May 2017, during a maintenance shutdown at a processing plant, a tank that normally held sulphuric acid slurry was temporarily used for storing limestone slurry.

When the tank was returned to service, it was drained of limestone slurry and filled to launder level with acidic slurry. However, although the tank had been emptied, limestone residue had accumulated at the bottom. When the tank was filled with acidic slurry and the agitator turned on, there was a rapid acid-base reaction between the free sulphuric acid and limestone, liberating carbon dioxide gas which could not readily escape. The tank's fibreglass roof burst and about 10,000 litres of hot slurry (87°C) escaped from the tank.

A process technician working on the platform of the tank fled the bulk of the hot slurry by jumping over a nearby handrail onto an adjacent tank platform. He was treated for minor injuries, including burns.

Probable causes

Direct

- The reaction between the free sulphuric acid and limestone in solution resulted in the uncontrolled liberation of carbon dioxide gas.

  Note: The rate of reaction was increased by the high temperature of the slurry (87°C) and agitation of the solution, which made the residual limestone more readily available for reaction with the free acid.

Contributory

- The risk assessment was not adequate and failed to identify the hazard associated with mixing of the acid slurry with limestone that might accumulate on the bottom of the tank.

Failed tank. Left. Damage to tank roof; cross indicates where the process technician was standing prior to tank failure. Right. Arrow indicates the escape path taken by the process technician over the handrails using the actuator. Note the slurry (at ground level) in foreground of pictures.

- Control measures, such as cleaning the tank to remove residual limestone before refilling it with acidic slurry, were not implemented.
- There was only one means of access or egress from the tank platform.

Actions required

Change management

Significant changes at a mining operation should prompt the completion of a risk assessment that adequately identifies the potential impact of the proposed change on the working environment.

- Develop and implement change management procedures to identify the potential impact of the proposed changes on the working environment.
- A risk assessment should identify hazards, and assess and control all risks that may arise from the change, including those to workers. As part of the risk assessment process:
  - consult with those who may be affected by the change
  - provide them, in so far as is practicable, with adequate information, instruction, training and supervision about the change.

Plant

Responsible persons are reminded that under the Mines Safety and Inspection Regulations 1995 the following requirements apply to plant.

- Employers must ensure that plant at the mine is used only for the purpose for which it was designed, unless the employer has determined, and a competent person has assessed, that a proposed change in use does not present an increased risk of exposure to any hazard [r. 6.21(a)].
- So far as is practicable, an emergency exit is provided from each treatment plant and building on the surface of the mine [r. 4.31(a)]. In addition to the usual means of access.

Further information

- Department of Mines, Industry Regulation and Safety, Mining safety publications, **www.dmp.wa.gov.au/Safety/Mining-Safety-publications-16162.aspx**

  Consultation at work – code of practice

  Effective safety and health supervision in Western Australian mining operations – guideline

DANGEROUS GOODS SAFETY BULLETIN NO. **0217**

EMERGENCY BREAKDOWN PROCEDURES WHEN TRANSPORTING UNODOURISED LP GAS

ISSUED: 7 JULY 2017

Background

Following a recent incident the Department has concerns regarding work practices in emergency breakdown situations for vehicles carrying unodourised liquefied petroleum (LP) gas. Especially in remote or rural areas away from appropriately trained maintenance workers.

During an inspection in a regional centre, a tanker containing unodourised LP gas residue, was observed parked-up on a side road in a major industrial area. A local mechanic was repairing the vehicle in the driver's presence, undertaking hot work on wheel-bearings which had been overheating.

The hot work was being done without a hot work permit, an established exclusion zone and continuous gas monitoring.

Note: The transport of unodourised LP gas must comply with special provision AU03 of Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code). Part of this provision requires that properly calibrated and operational gas monitors be used to monitor atmosphere for presence of unodourised LP gas in the vicinity of the load.

The vehicle's gas monitors were not charged and there were no records of readings taken at the vehicle's last stop as required by special provision AU03. The mechanic also had no hazardous areas awareness training.

Summary of hazard

LP gas is extremely flammable. It ignites easily at room temperature and when mixed with air in an enclosed space, it can quickly form an explosive mixture. Conducting hot work activities in a hazardous area creates a significant risk of fire or explosion.

Unodourised LP gas presents an additional risk as it does not contain any mercaptans which produce a smell; therefore a gas detector is required to detect leaks.

Contributory factors

- Failure to follow hot work safety procedures and special provision AU03.
- No procedure or plan for vehicle breakdowns in regional areas.
- Inadequate training and supervision of maintenance contractors.
- Insufficient number of charging units for all electrical equipment (gas detectors) in vehicles.

Actions required

A prime contractor who transports dangerous goods must take all reasonably practicable measures to minimise the risk to people, property and the environment from the dangerous goods. They must also ensure that any ignition source in a hazardous area is eliminated or, if this is not reasonably practicable, the risk arising from an ignition source is controlled.

The following actions are recommended when transporting unodourised LP gas.

Safe systems of work

- Review maintenance procedures and if required, update to cover emergency breakdowns in remote areas in accordance with Section 11.8.6, AS/NZS 1596 *The storage and handling of LP Gas*.
- Complete a job safety analysis to identify hazards prior to commencing any hot work in hazardous areas.
- Use a permit-to-work system to authorise all hot work and identify the required precautionary measures.

- Provide appropriate and regular training (including refresher training for long-term employees) on hot work procedures, the proper use and calibration of gas detectors and job specific hazards.
- Regularly audit gas leak test records to ensure that gas detector monitoring is being undertaken as required by special provision AU03.

Maintenance and supervision

- Avoid hot work and use alternative methods whenever possible.
- Install additional hard-wired, gas-detector charging units in ad-hoc vehicles.
- Adequately supervise maintenance contractors conducting hot work and provide them with sufficient information about the specific hazards around dangerous goods.
- Consider pre-qualification of maintenance contractors in major regional centres.

Further information

- Standards Australia, **www.standards.org.au**
  AS/NZS 1596 *The storage and handling of LP Gas*
- National Transport Commission, **www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code**
  Australian Code for the Transport of Dangerous Goods by Road and Rail, Edition 7.4

DANGEROUS GOODS SAFETY BULLETIN NO. **0317**

ACCESS TO FIRE EXTINGUISHERS ON PETROL STATION FORECOURTS

ISSUED: 19 JULY 2017

Background

Petrol stations contain large quantities of flammable dangerous goods so the consequences of a fire can be catastrophic. Under the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 and relevant Australian Standards (i.e. AS 1940, AS 2444), there are requirements for petrol station operators to:

- ensure that fire extinguishers are
  - always available for immediate use to extinguish a fire
  - not obstructed or positioned such that their operation or access to them is hindered
- provide induction, information and training on fire equipment kept at the site.

Concerns have been raised with the Department regarding the inaccessibility of fire extinguishers on petrol stations forecourts. In some instances due to theft, petrol station operators have been keeping fire extinguishers inside the store or removing the key from the break-glass screen of the fire extinguisher.

Note: An example of what can happen when a fire extinguisher is not used during the early stages of a fire is illustrated by the Maddington fuel tanker fire. "On Friday 15 May 2009, a fuel tanker was unloading petrol into underground tanks at a suburban service station when a fire started at the fill point. During the early stages of the fire, the tanker driver did not use the fire extinguishers installed on the tanker nor those available at the petrol station. The fire spread from the fill point to the tanker. Use of the available fire extinguishers may have prevented the tanker from catching fire."

Maddington fuel tanker fire in 2009

Summary of hazard

The delay in retrieving a fire extinguisher that is not readily or safely available may result in the escalation of a fire so it 'takes hold', causing a significant amount of damage and potential injury to those in the vicinity.

Contributory factors

- Petrol station operators are placing fire extinguishers in less accessible locations.
- The risks associated with relocating or restricting access to fire extinguishers have not been effectively identified, evaluated or addressed in the context of the overall operation of the site.

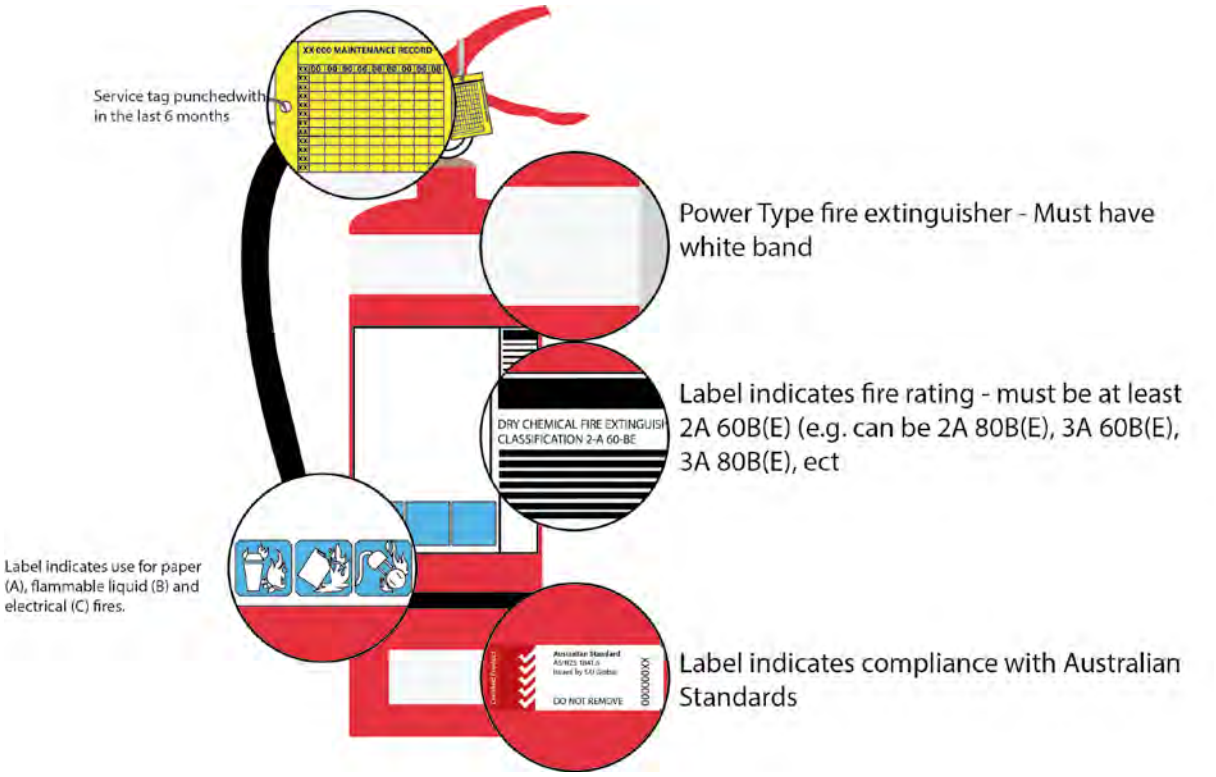
Actions required

Safe systems of work

- Review risk assessments before moving the location of safety equipment.
- Confirm that fire extinguisher locations and access meet the requirements of the relevant legislation and Australian Standards.

Fire extinguisher requirements

- Provide a minimum of two powder-type fire extinguishers at each service station.
- Confirm each extinguisher has a minimum rating of 2A 60B(E).



Fire extinguisher requirements for petrol stations

- Locate extinguishers near dispensers or other items being protected.
- Confirm extinguishers are accessible without undue danger in an emergency.
- Mark each extinguisher location with a 'FIRE EXTINGUISHER' sign mounted at least 2 m above ground.
- Routinely service fire extinguishers at least every 6 months.

Further information

- Standards Australia, www.standards.org.au

  AS 1851 *Routine service of fire protection systems and equipment*

  AS 1940 *The storage and handling of flammable and combustible liquids*

  AS 2444 *Portable fire extinguishers and fire blankets – selection and location*

- Department of Mines, Industry Regulation and Safety

  Dangerous goods safety matters – Self-check guide for petrol stations, www.dmp.wa.gov.au/Documents/Dangerous-Goods/DGS_G_SelfCheckGuideForPetrolStations.pdf

  Incident investigation report – Fuel tanker fire at Maddington, www.dmp.wa.gov.au/Documents/Dangerous-Goods/DGS_SafetyStats_AR_FuelTankerFireAtMaddington2009.pdf

DANGEROUS GOODS SAFETY BULLETIN NO. **0417**

SECURITY OF EXPLOSIVES

ISSUED: 31 OCTOBER 2017

Background

Explosives have recently been found in the possession of members of the public not authorised to possess them. This has raised concerns with the Department of Mines, Industry Regulation and Safety in regards to explosives safety and security.

Industries engaged in the possession and use of explosives are reminded of the need to have appropriate controls and procedures in place to ensure explosives are secure from sabotage, theft, unexplained loss and that there is no unauthorised access.

The requirements for the safe storage and security of explosives are outlined in the Dangerous Goods Safety (Explosives) Regulations 2007, the *Australian Code for the Transport of Explosives by Road and Rail, 3rd Edition* (AEC3) and Australian Standard 2187 *Explosives – Storage, transport and use*.

Note: Recently the Western Australian Police and the Department investigated the theft of explosives from a mine site. Despite site records showing discrepancies between the recorded quantities and the actual quantities of explosives stored, these discrepancies were not investigated by the company. The root cause of the theft of the explosives was the illegal conduct of a trusted employee.

Summary of hazard

The safety of the community is put at risk if explosives are accessed by unauthorised persons and are used inappropriately.

Contributory factors

The security of explosives may be compromised if legislative requirements are not adhered to, if security risk assessments are inadequate, and security plans not complied with, regularly reviewed or updated.

Actions required

Safe systems of work

- Regularly review and update the security plan and security risk assessment to ensure it is current and effective. This includes:
  - checking physical controls such as magazines, locks, fences, security patrols and key security on a regular basis
  - regularly training staff on, and confirming that, the security plan is understood and complied with
  - confirming that reporting systems are working and workers are aware of what should be reported (e.g. suspicious activity or behaviour)
  - undertaking regular audits and inspections.

  Note: As part of the security risk assessment process for your operation consider additional measures that could reduce the potential for sabotage or theft, such as:
  - *ensuring one person does not have access to detonators, high explosives and an exploder at the same time, unless part of a planned blast*
  - *when accessing an explosives magazine have two people present to ensure accurate record keeping and an actual need for the explosives*
  - *regularly checking the national terrorism threat level and updating your security risk assessment and security plan for the current threat level.*
- Confirm that contractors who have access to explosives are aware of the operations' explosives management plan and are regularly audited.

Security measures

- Check that worker's dangerous goods security cards and other security clearances are current and appropriate to the position held.
- Monitor and control access to explosives and regularly check the detailed records of supply and access.
- Investigate any theft, attempted theft or any unexplained loss of an explosive and report this to the Chief Officer as soon as is reasonably practicable and immediately to the police.

Further information

- Standards Australia, **www.standards.org.au**
  AS 2187 *Explosives – Storage, transport and use*
- Safe Work Australia, **www.safeworkaustralia.gov.au/doc/australian-code-transport-explosives-road-and-rail-3rd-edition**
  Australian Code for the Transport of Explosives by Road and Rail, 3rd Edition
- Australian National Security, National terrorism threat advisory system, **www.nationalsecurity.gov.au**

DANGEROUS GOODS SAFETY BULLETIN NO. **0517**

SUITABILITY OF DRY CHEMICAL POWDER FIRE EXTINGUISHERS WHEN TRANSPORTING EXPLOSIVES AND OTHER DANGEROUS GOODS

ISSUED: 20 NOVEMBER 2017

Background

Both the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG) and the *Australian Code for the Transport of Explosives by Road and Rail* (AEC) require transport companies to carry dry chemical powder (DCP) fire extinguishers when transporting dangerous goods.

There have been two incidents in Western Australia in the past two years where DCP fire extinguishers have not effectively extinguished a brake or tyre fire on a vehicle transporting ammonium nitrate (AN). In both cases, these were the only type of fire extinguisher carried and the fire reignited shortly afterwards. The vehicles involved had been regularly serviced and well maintained.

In the first incident, the driver used all four DCP extinguishers on the vehicle. When the fire reignited, an exclusion zone was set up around the vehicle to let the fire burn itself out – fortunately without further incident. In the second incident, after the use of two DCP extinguishers, passing motorists assisted the driver in effectively extinguishing the fire by providing two foam fire extinguishers and water.

Summary of hazard

A fire on a vehicle transporting dangerous goods can pose a risk to the load and its containment, the integrity of the vehicle, as well as people, property and the environment. For example, when AN or explosives are involved in a fire there is the potential for detonation of the load. Additionally, AN has a low melting point and when molten it becomes both shock sensitive and unpredictable.

Note: In September 2014, a road train carrying AN left the road on approach to the road bridge at Angellala Creek, Queensland. The prime mover caught fire and the load of AN exploded an hour and 17 minutes later, injuring eight people and extensively damaging nearby infrastructure.

Contributory factors

Although DCP fire extinguishers are effective, they do not remove the heat from metal and rubber, which can lead to reignition.

Note: DCP extinguishers contain a very fine powder that acts as a blanketing agent preventing access to the oxygen required to support the fire. However, it does not remove the heat from the medium (e.g. tyre or brake), thus reignition is possible when there is a break in the DCP coverage.

Actions required

The ADG and AEC codes only require prime contractors to carry DCP fire extinguishers. These codes are mandated by the *Dangerous Goods Safety Act 2004*, however under this Act, there is also a duty to minimise risk.

In light of these recent incidents, the Department of Mines, Industry Regulation and Safety has recommended to the National Transport Commission (NTC) that vehicles transporting security sensitive ammonium nitrate (SSAN) carry water-based fire extinguishers in conjunction with DCP fire extinguishers.

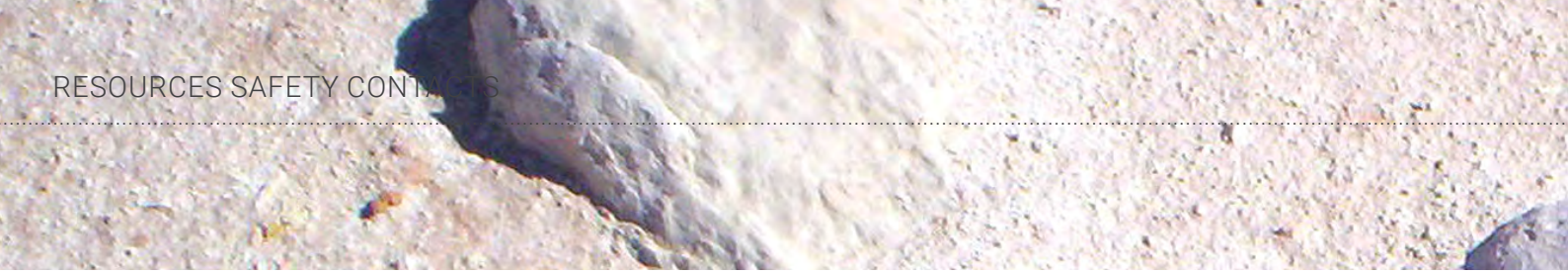
It is strongly recommended that companies transporting SSAN, explosives and other dangerous goods:

- review the number and type of fire extinguishers carried on their vehicles to ensure they are appropriate for likely scenarios the driver may encounter (e.g. tyre and brake fires)
- consider carrying water-based fire extinguishers (i.e. foam, water) in conjunction with the required DCP fire extinguishers.

  Note: Water-based fire extinguishers can be used to quench the heat in the system once the fire has been extinguished with DCP fire extinguishers.
- consider providing refresher training to drivers in the use of fire extinguishers in emergency situations.

Further information

- National Transport Commission, Australian Code for the Transport of Dangerous Goods by Road and Rail, Edition 7.5 (ADG Code), **www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/**
- Safe Work Australia, National codes of practice (prior to WHS laws), Australian Code for the Transport of Explosives by Road or Rail, 3rd edition (AEC3), **www.safeworkaustralia.gov.au/resources_publications/allitems**
- Business Queensland, Angellala Creek significant incident investigation, **www.business.qld.gov.au/industries/mining-energy-water/explosives-fireworks/safety-security/significant-incident-reports/angellala-creek**



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Iluka Resources won the Systems and People category in the 2017 Safety and Health Resources Award [TYC]

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