

Resources Regulator
Department of Regional NSW

NSW Resources Regulator

Anthony Margetts
Principal Inspector Mining
Engineering

March 2023

regional.nsw.gov.au



Meeting Protocols

- Face to face meeting only going forward, nothing recorded
- This forum is designed for collaboration between mines and the NSW Resources Regulator
- Aim is to keep as informal as possible to allow conversations to flow
- Please don't hold back, give your opinion, challenge and ask questions

Today's Agenda

Mining Engineering Manager Open-Cut Forum

Cypress Lakes Resort, 15 Thompsons Rd, Pokolbin NSW 2320, Australia

Wednesday 15 March 2023

08:50 – 09:00 Registration

9:00 – 10:30 **Session 1**

Welcome to country, opening and housekeeping – Anthony Margetts, NSW Resources Regulator

NSW Resources Regulator CAU Updates – Tom Richards, NSW Resources Regulator

NSW Resources Regulator MEM Updates – Anthony Margetts, NSW Resources Regulator

NSW Resources Regulator Inspector updates – Barry Coe and Bill McGlynn, NSW Resources Regulator

Real time dust monitoring at HVO – Kristy Prior and Hamish Rae, Hunter Valley Operations

10:30- 11:00 **Morning tea**

11:00 – 12:30 **Session 2**

Collaboration Session

12:30-13:00 **Lunch**

13:00-14:40 **Session 3**

Bengalla significant dump failure – Glenn Meyn and Jake Kell, Bengalla Mining Company

Mt Pleasant operational dump failure – Ryan Fox, Mt Pleasant Operations

HVO operational dump failure – Greg McCormack, Hunter Valley Operations

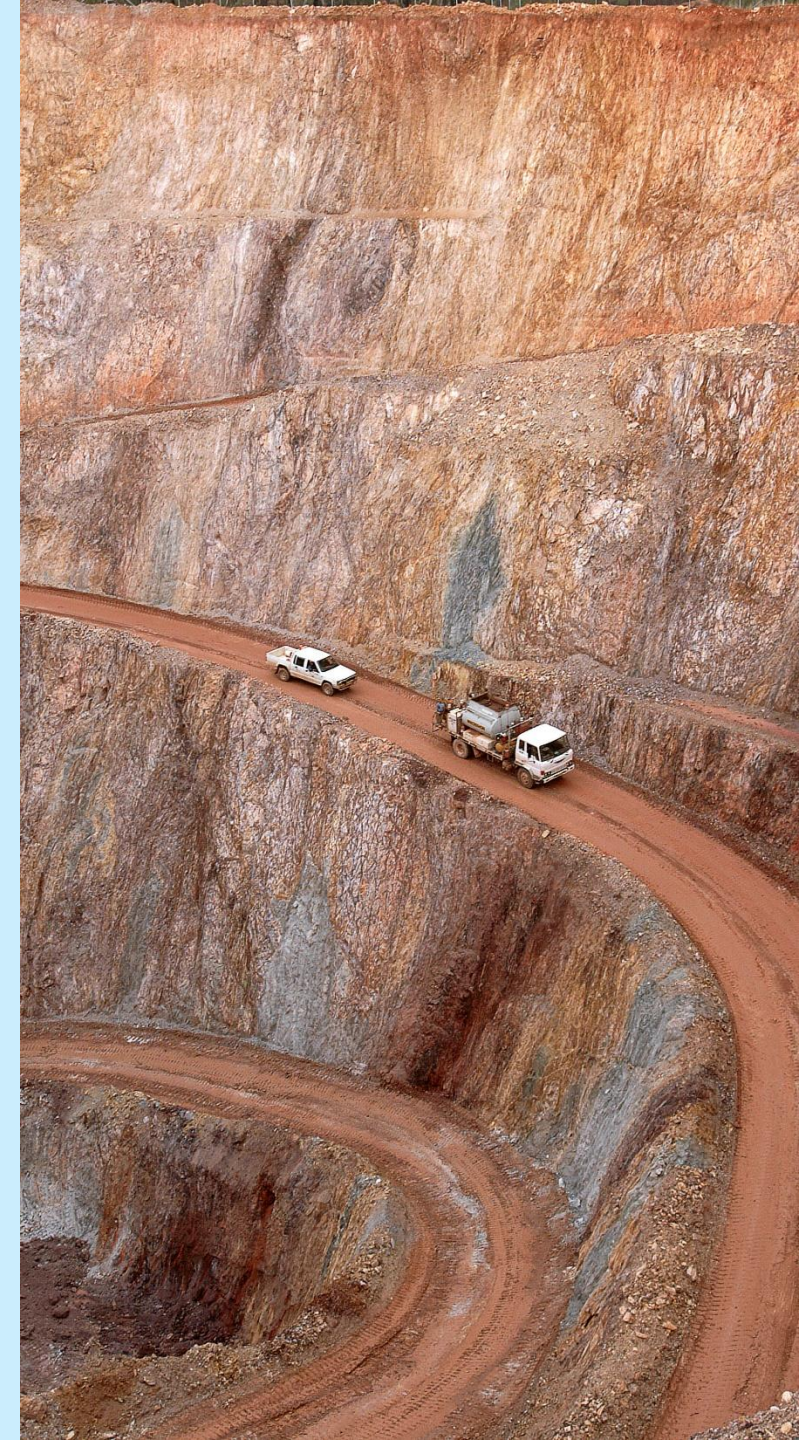
Closing remarks – Anthony Margetts, NSW Resources Regulator

Central Assessment Unit

Surface Coal Mining Engineering Managers Forum

Tom Richards

15 March 2023



Reporting reminders

1

Incident hotline

08:00 – 16:00 Monday – Friday (excl. public holidays)

CAU operating

16:00 – 08:00 weekdays

Inspector on call

CAU & Mech/Elec Engineering Inspectors

Weekends + public holidays

Principal Inspectors

Outside business hours third party
call centre screen the calls.

Escalation process in place if the
transferred call is unanswered by
an Inspector

Dangerous vs High Potential

Work Health and Safety (Mines and Petroleum Sites) Regulation 2022

124 Duty to notify regulator of certain incidents

(5) In this section—

(a) an event referred to in section 190(1) that would have been a dangerous incident if a person were reasonably in the vicinity at the time when the incident or event occurred and in usual circumstances a person could have been in the vicinity at the time,

Dangerous vs High Potential

Work Health and Safety (Mines and Petroleum Sites) Regulation 2022

124 Duty to notify regulator of certain incidents

(5) In this section—

(a) an event referred to in section 190(1) that would have been a dangerous incident **if a person were reasonably in the vicinity** at the time when the incident or event occurred **and in usual circumstances** a person could have been in the vicinity at the time,

Injuries

An incident is considered serious if:

- an injured worker is admitted to hospital immediately

This includes where admission is delayed as the worker is referred to a different hospital where specialist treatment is not available

- a fractured to any bone other than the hand or foot.

The ankle is not part of the foot

The wrist is not part of the hand

**If an injury escalates
please notify when you become aware**

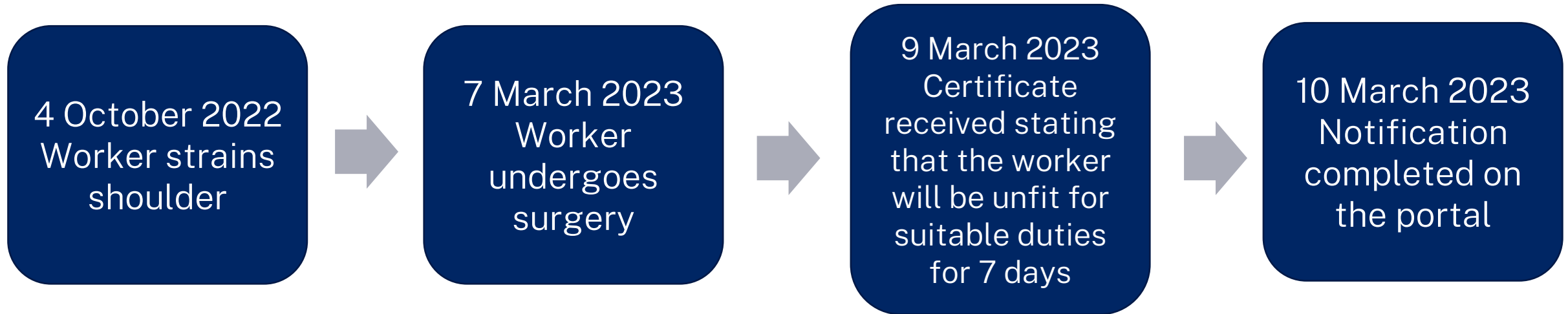
Notifier aware

3 date fields in an incident:

- The Incident date & time
- The date and time the notifier became aware the incident was notifiable
- The date and time the regulator was notified

System generates non-compliance for those reported outside of the legislated requirements

Notifier aware



Incident date	4 October 2022
Date notifier became aware	9 March 2023
Notified to Regulator	10 March 2023

Additional information needed

Any updates to incident status

- Workers still trapped or unaccounted for
- Injured workers
- Changes to incident scene/status

Witness statements

- Statement from workers involved
- Statement from witnesses
- Statement from responders

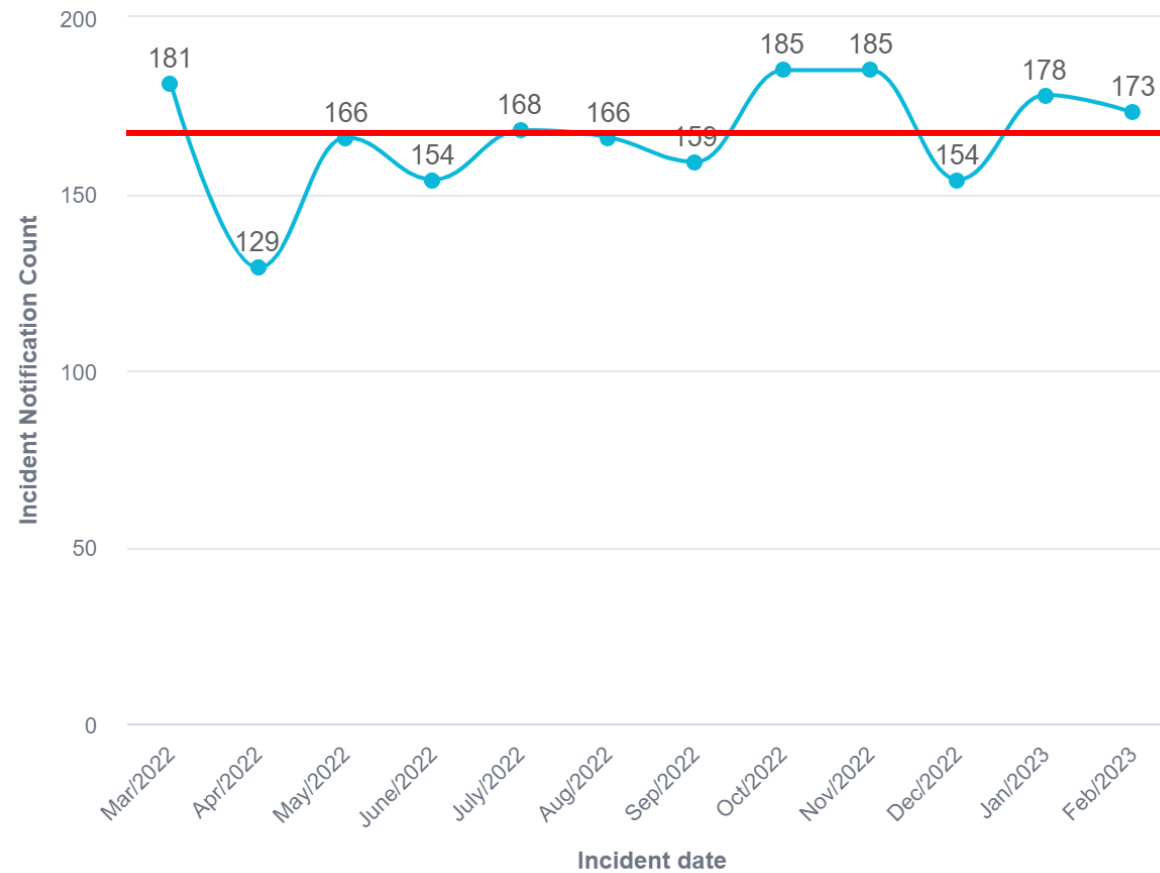
Photos of the incident scene

- Photos of area
- Close ups photos of failure point
- Any video footage available

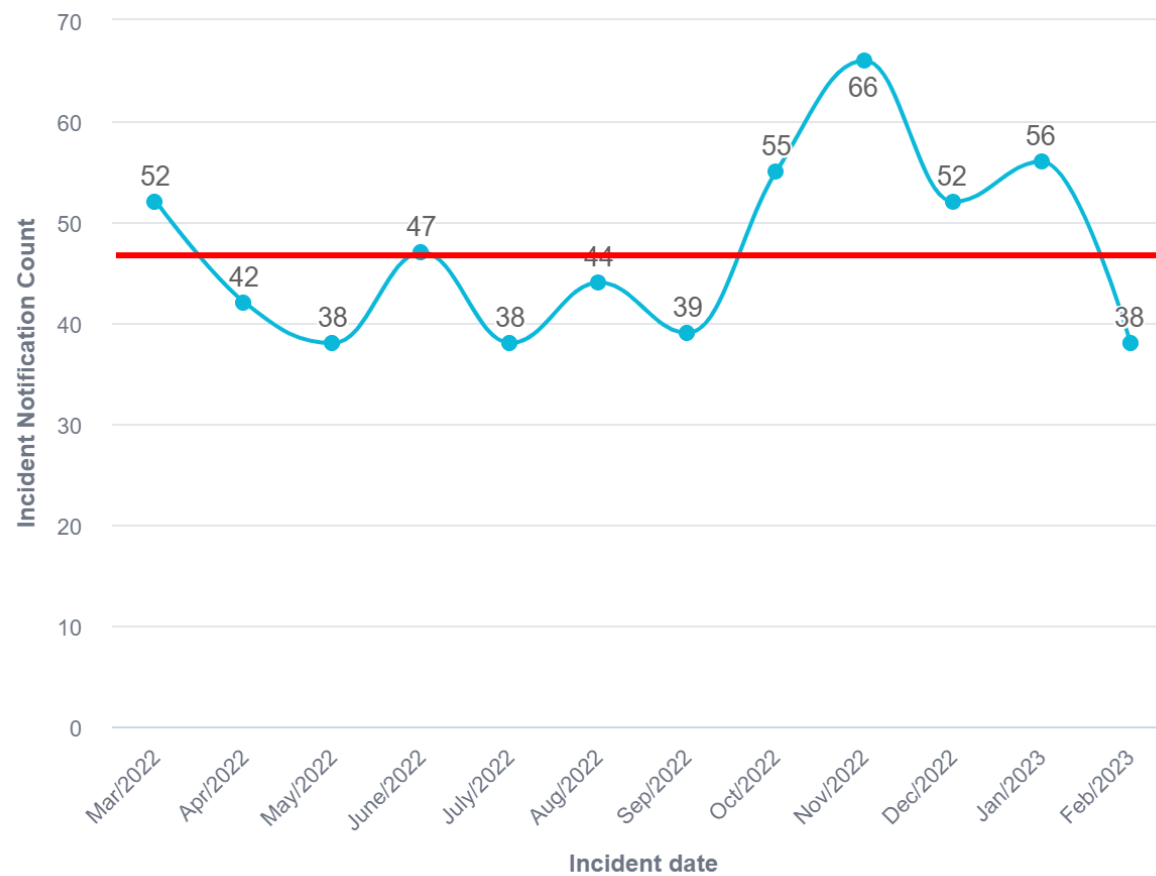
Incident trends

2

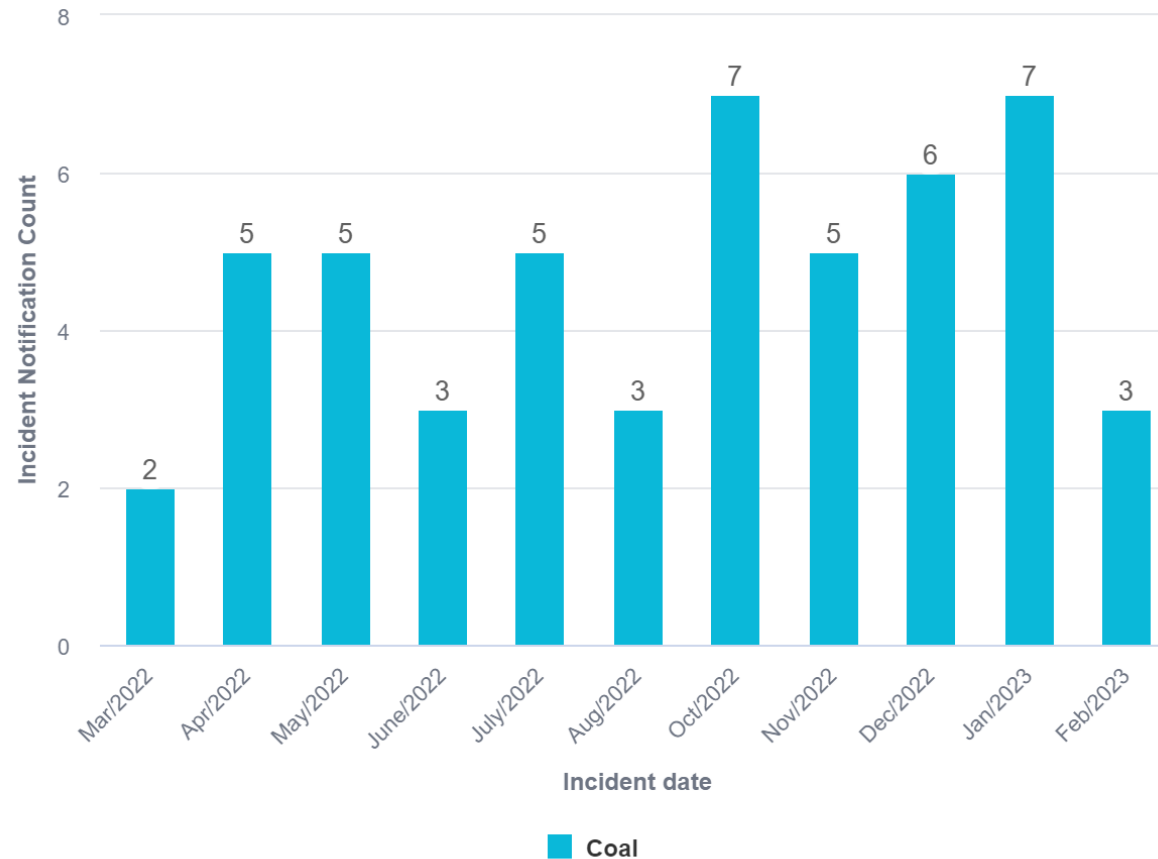
12 month incident trend



12 month incident trend – surface coal



Collisions – surface coal



Wet roads & wa

Safety bulletin

NSW
RESOURCES
REGULATOR

DATE: MAY 2018

Overwatering of roads leads to vehicle incidents

This safety bulletin provides safety advice for the NSW mining industry.

Significant safety issue

Overwatering of mine roadways decreases tyre traction (skid resistance) and therefore increases braking time. It may also contribute to destabilisation of fill slopes and erosion.

It is well understood that haul trucks and other vehicles cannot stop quickly on wet roads. Hard braking on a wet road can easily result in a vehicle losing control and colliding with safety berms, other vehicles or infrastructure. Additionally, standing water can soften road bases, potentially leading to road failures and collapsing fill sections and slopes.

Poorly designed and maintained roads also leads to increased operational costs in road maintenance, fuel, loss of production and tyres.

Background

For the period January 2017 to February 2018, there have been 20 incidents reported to the Resources Regulator where it has been identified that overwatering or water on roads has led to the loss of control of a vehicle. This represents almost one-third of the total number of loss-of-control incidents reported during this period.

Mine roads are generally watered to suppress dust. This is done through checkerboard or spot intermittent pattern on slopes to reduce the risk of slipping during braking. This process attempts to leave intermittent dry and wet lines for vehicles to use, minimising slippery conditions. Spot watering works well for areas with limited water supplies.

There are chemical-type dust suppressions available, but these are not regularly used in the mining industry, usually due to the cost.

Investigation

In reviewing the reported circumstances of these events, generally mine operators have not identified whether there were contributing factors, other than a wet road surface.

It is noteworthy that the following issues were not identified as contributing factors in these incidents:

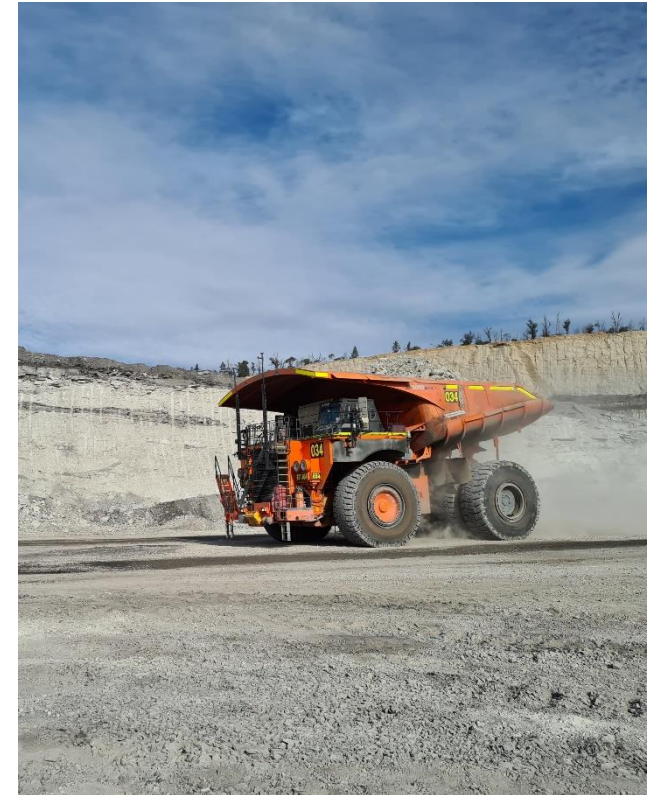
- **Road construction or materials used in the road construction:** A clay surface can lose up to 50% of its coefficient of friction through the application of water (Refer to Mines safety bulletin No. 94 [Excessive watering of haul roads](#) –January 2010 – Qld Department of Natural Resources and Mines)
- **Road slope/grade:** Mines tend to not report incidents if the road was not designed to suit the equipment used on it.



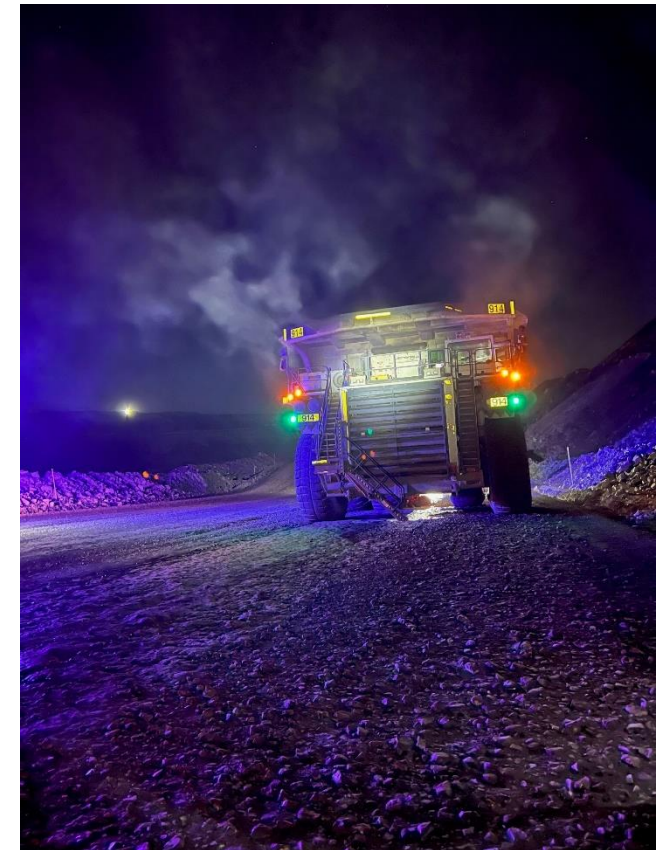
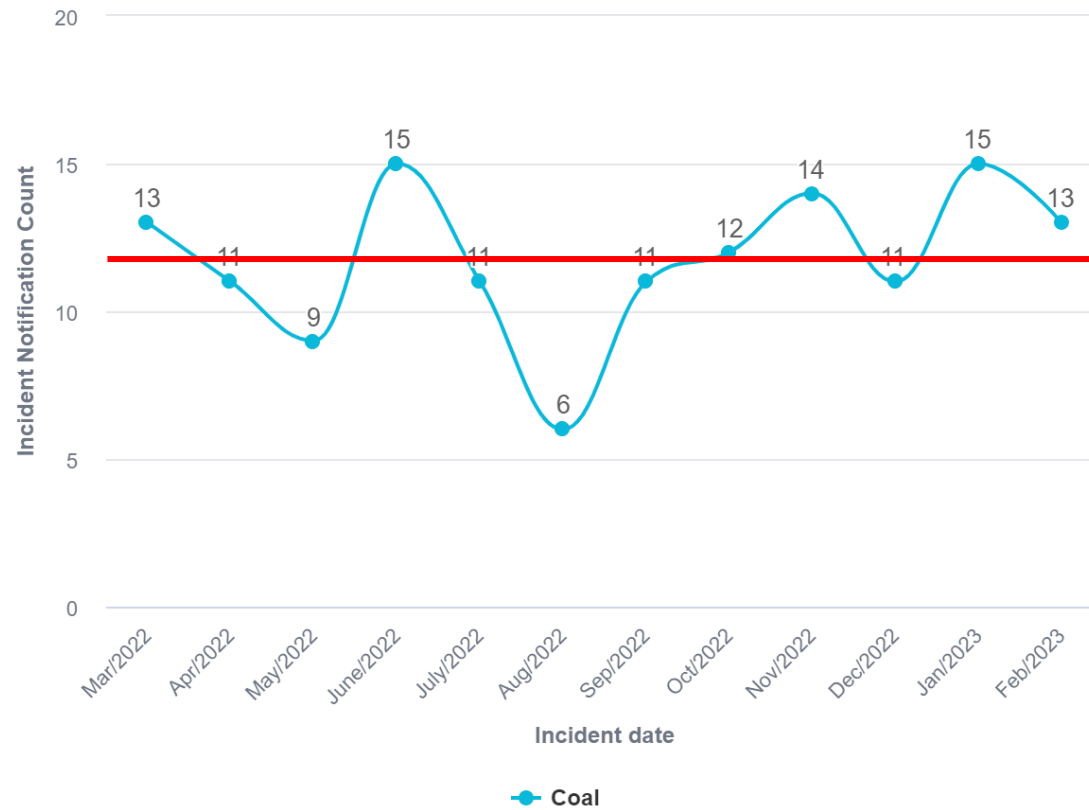
Trainee operators

Seeing an increase in incidents notified relating to trainee operators.

- What triggers a trainee's assessment to go solo?
- What does drive to conditions mean to a trainee?
- What follow up assessments are conducted after a trainee is appointed to operate solo?
- Is there a cap on how many trainees on a shift?
- Is their adequate supervision and mentoring capability on shift?



Fires on mobile plant



Safety Alert

Date: October 22

Operator unable to activate fire suppression system during emergency

This safety alert provides safety advice for the NSW mining industry.

Issue

When a fire occurred on a dozer, the operator tried to activate the fire suppression system when the panel cover separated from the mounting bracket, forcing the operator to abandon the plant.

Figure 1 - Actuator panel separated from the mounting bracket



Circumstances

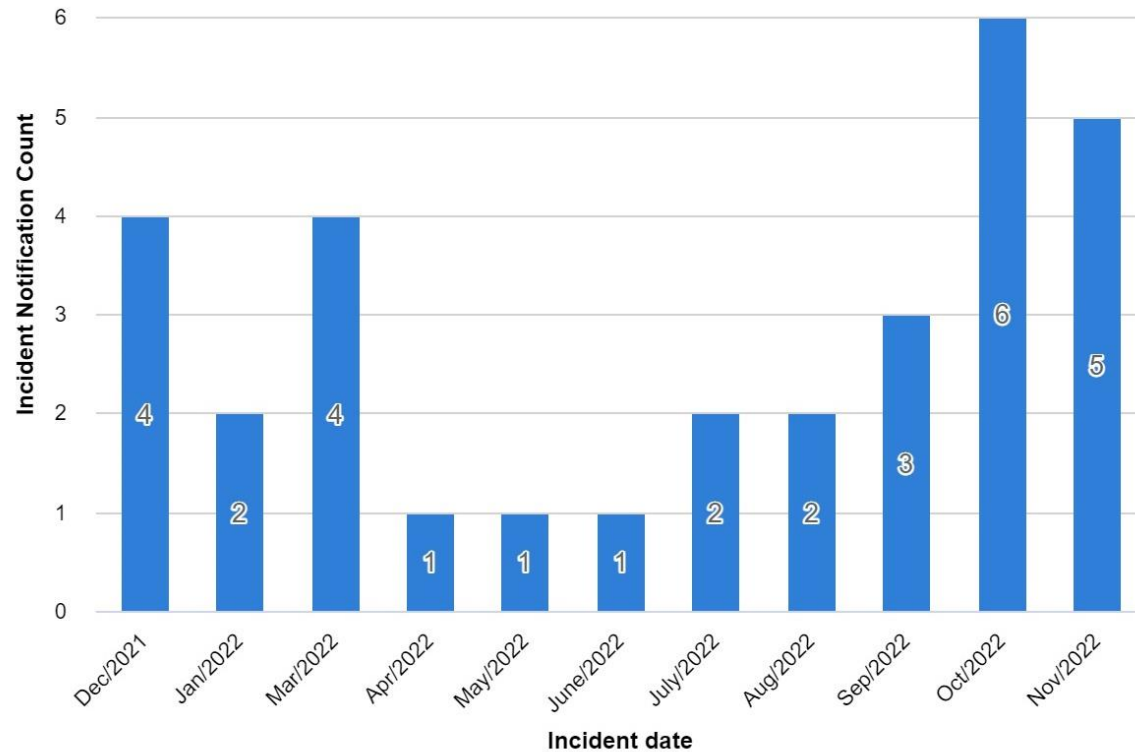
A Caterpillar D10T bulldozer was operating at an open cut coal mine when a fire occurred in the engine bay. The operator saw smoke and flames and tried to activate the fire suppression system, but the valve and panel cover separated from the mounting bracket when trying to withdraw the safety pin.

Not knowing if the system could still be activated, the operator reversed a short distance, lowered the access ladder and pressed the red emergency button. With flames licking up through gaps around the deck plate, the operator exited the cabin via the left-hand door and jumped from the

Set up machines to allow operators to succeed

- Safety pin caught around activation lever
- Dozer was hired, different system to those used across the mine fleet
- Wrong instruction sticker next to panel
- Change management had been done, these items not identified


Electric Shock



Other observations

3

Emergency response



NSW Resources Regulator

SAFETY ALERT

Stranded tailings dam

DATE: August 2022

Worker swims to shore after pontoon pump and boat sink

DATE: September 2022

This safety alert provides safety advice for the NSW mining industry.

Issue

A 14-tonne amphibious excavator became immobilised on a pontoon pump. The operator was stranded on the pontoon and had to swim to shore for rescue.

Circumstances

The excavator was used to maintain a pontoon pump. The pump became unbalanced and overturned, dragging the pontoon and boat under water.

Investigation

The investigation identified that the pump was unbalanced due to a faulty pulley and a change in the centre of gravity.

- The capability of the pump was not fully understood.
- The risk assessment did not account for the potential for the pump to overturn.

Within minutes, the worker noticed the pontoon tilt and jumped in the water to swim 30 m to the bank. As he swam, the pontoon overturned, dragging the boat under the water with it. The worker was not injured.

An amphibious excavator was working on a tailings dam. The rescue plan was to use an ATV. After the excavator became immobilised, the ATV was deployed to rescue the worker. The ATV couldn't get traction.

The worker was recovered 7 hours later.

A contract worker was maintaining a pontoon pump. A boat was used to access the pump. A component was removed which affected the balance and the pontoon started to sink. The worker was alone and had removed his life vest while on the pontoon.

The worker swam to shore.

Planned task observation challenge

When was the last time you really challenged a standby worker?

EWP task – stop the job

Challenge the standby person



Thank You

Resources Regulator
Department of Regional NSW

NSW Resources Regulator Update

Anthony Margetts
Principal Inspector Mining
Engineering

March 2023

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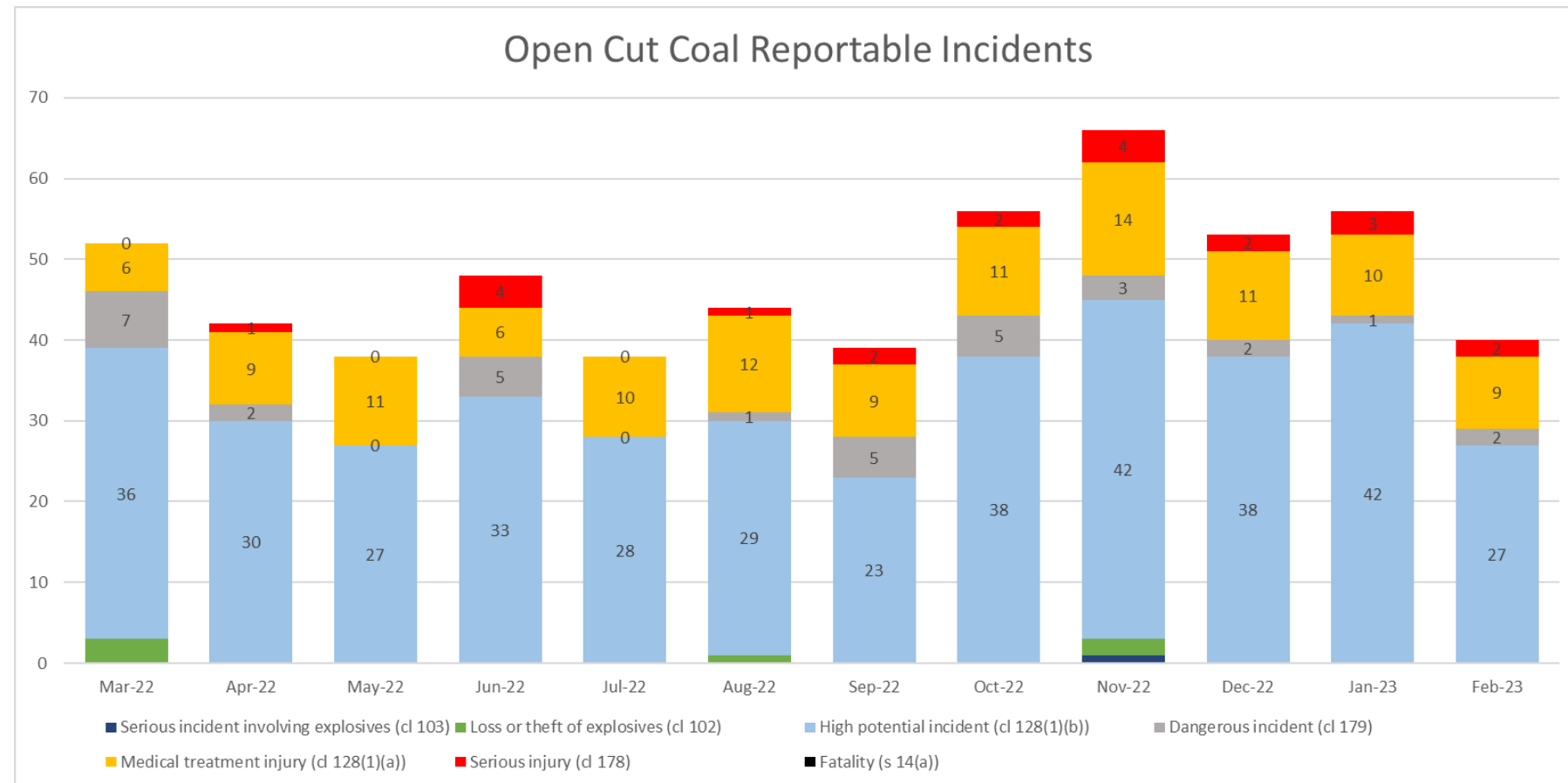
Presentation Summary

In this presentation we'll cover:

- Brief Look at recent statistics
- Recent Publications
- Collision Avoidance Forum - update

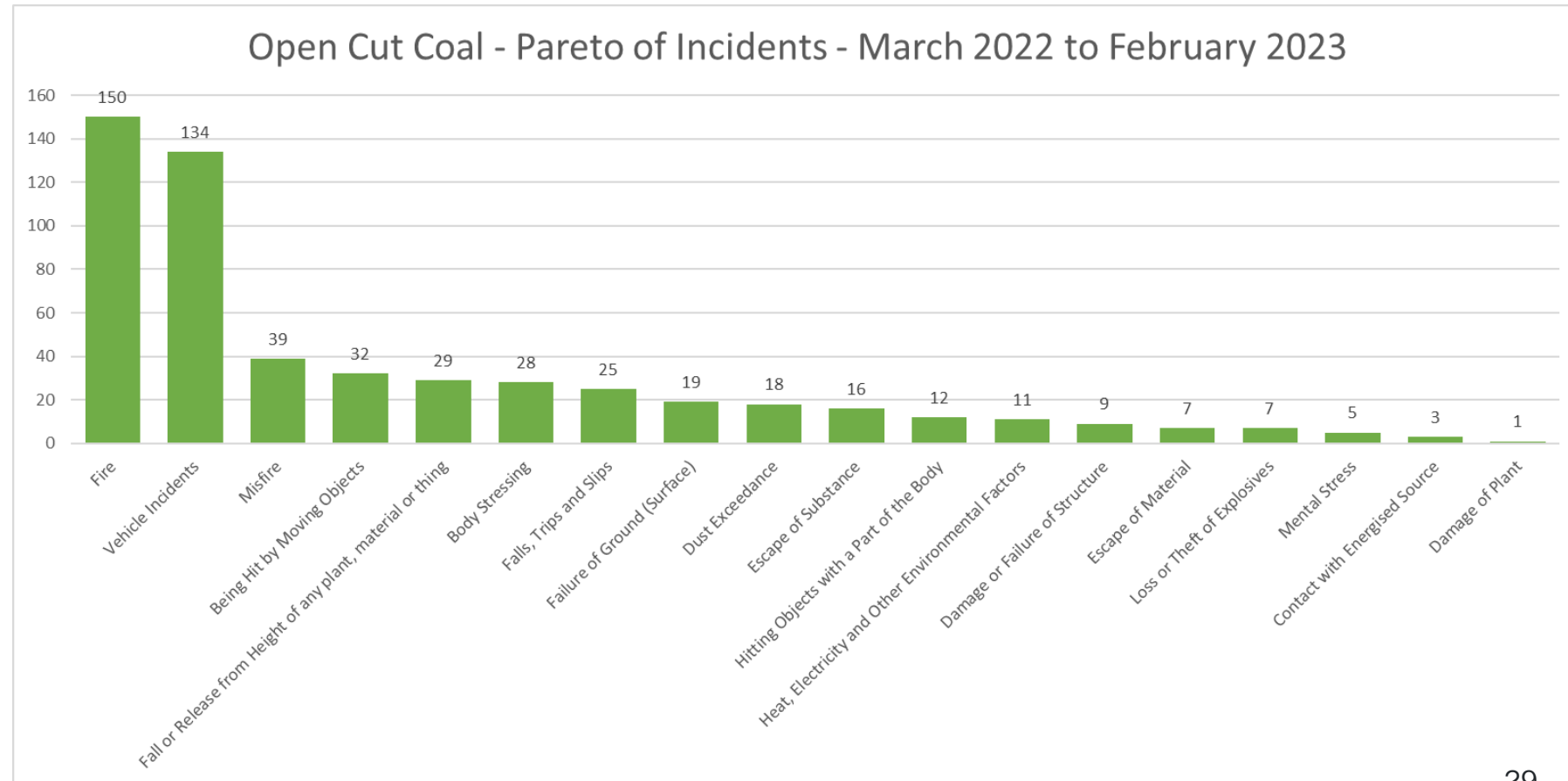
Open Cut Coal Statistics

- Recent increase in total incidents reported
- Mostly due to HPI's



Open Cut Coal Statistics

- Fires and vehicle incidents by far the most common across open cut coal
- Miss-fire reporting has steadily increased

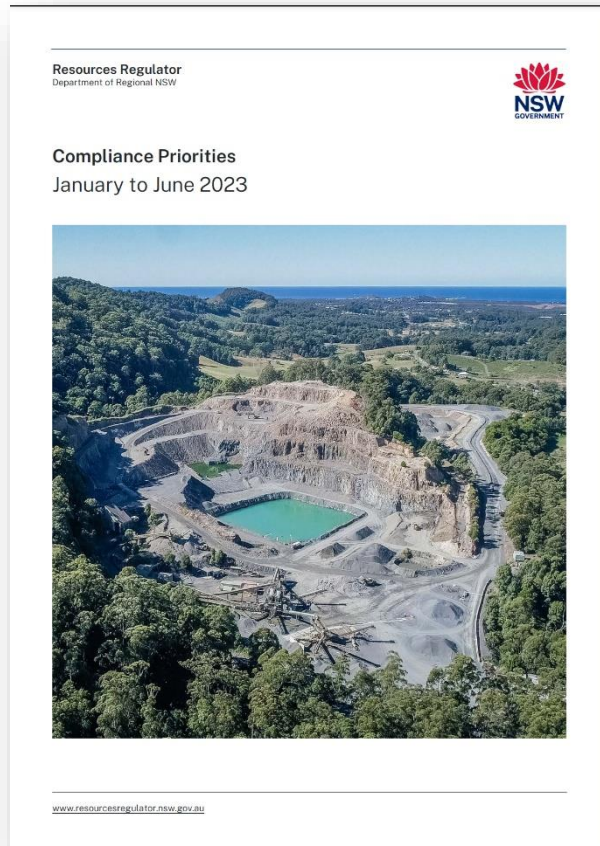


Keeping up with Publications

- Keep Informed
- Ensure you are subscribed to the [Mine Safety News](#) (hyperlinked)
- This subscription contains all our Safety Alerts & Bulletins, Compliance plan reports, Priorities, Forums, Statistical reports and more



Recent Publications – Compliance Priorities



H1 2023 Compliance Priorities


- Implementation of updated WHS (MPS) Regs
- Managing Psychosocial Risk (Regs Amendment)

H1 2023 Assessment Programs

- Health Control Plan
- Roads and other vehicle operating areas
- Structural integrity
- Electrical control plan

Recent Publications – Consolidated Reports


Resources Regulator
Department of Regional NSW



Consolidated report (stage 3)
Ground or strata failure -slope stability of stockpiles
– open cut coal mines
November 2021 – August 2022

regional.nsw.gov.au/meg

Resources Regulator
Department of Regional NSW



Consolidated report
Electrical engineering control plan – exposure to an
uncontrolled release of electrical energy – coal mines
– stage 1
May 2021 to December 2022

regional.nsw.gov.au/meg

Recent Publications – Safety Alerts

Safety Alerts are issued for single incidents

Resources Regulator
Department of Regional NSW

Safety Alert

Date: March 2023

Unintended movement of haul truck

This safety alert provides safety advice for the NSW mining industry.

Issue

An operator of an MT4400 haul truck left the cabin and descended the main stairs to isolate the truck in response to alarms, and walked in front of the truck to the main isolator on the off driver's side front bumper.

The truck was not parked on level ground and started to roll forward when the battery isolator was turned off. The operator ran back in front of the rolling truck and up the main stairs to the cabin to apply the service (foot) brake. The incident occurred on 19 February 2023.

Figure 1: Drawing shows where the truck operator was located when the truck started to roll forward

Circumstances

The truck was next in the queue at a dig site to pick up its first load of the day after having a brake drag alarm fixed at the workshop. The operator had applied the dump brake while waiting.

An alarm identified the ladder had lowered on the main access stairs. This was confirmed by radio from the operator of the truck which was positioned at the excavator.

The maintenance team advised the operator to turn off the truck and isolate it. The truck was on grade and the wheels were not turned towards the windrow.

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Safety Alert

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Issue

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Figure 1 - Actuator panel separated from the mounting bracket

Circumstances

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Department of Regional NSW

Safety Alert

Date: October 2022

Service brakes fail on moving articulated dump truck

This safety alert provides safety advice for the NSW mining industry.

Issue

A loaded Caterpillar 740 articulated ejector truck ran out of diesel fuel and shut down ascending a 10% gradient.

The truck stopped, then rolled backwards for 49 m when the truck's service brakes (dynamic brakes) failed. The truck was only brought to rest when the park brake was activated. Park brakes are not designed for dynamic applications.

Service braking systems on mobile plant are safety critical systems. Their failure during operation has potential for fatal consequences. This incident highlights the importance of:

1. maintaining hydraulic accumulators on service and secondary braking systems, and
2. ensuring identified defects are assessed and repaired in a timely manner.

Circumstances

The operator of the truck was transporting gravel from a crusher to a stockpile when the truck lost drive while travelling up a 10% ramp on 13 July 2022. The truck was hired but being operated by the mine.

As the truck has begun to roll backwards, the operator attempted to apply the service brake. The brake pedal had no resistance, and the service brake did not apply. As the truck continued to roll backwards, the operator used the park brake to stop the truck. The park brake was difficult to engage and required several attempts. The truck rolled 48.8 m before coming to a stop.

The fuel tank was empty, and the fuel gauge was faulty. At the time of the event the fuel gauge was reading at a quarter full.

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Recent Publications – Safety Bulletins

Bulletins are issued for incident trends or concerns


NSW
Resources
Regulator

SAFETY BULLETIN

SEPTEMBER 2022

Fires occurring on mobile manufacturing unit trucks


This safety bulletin provides safety advice for the NSW mining industry.

Issue


The NSW Resources Regulator recently identified 2 incidents involving fires on mobile plant that have occurred on explosives mobile manufacturing unit (MMU) trucks.

While the fires were very small and quickly extinguished, explosives and oxidising agents such as ammonium nitrate present a high risk with potentially severe consequences in the event of being involved in a fire. The MMU fires were both at bulk explosives storage and reload facilities.

Figure 1 MMU truck moved away from bulk storage after a fire was detected



1


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SAFETY BULLETIN

DATE: AUGUST 2022

Mobile lighting plant at mining workplaces

This safety bulletin provides safety advice for the NSW mining industry.

Issue

During recent open cut coal mines inspections, mobile lighting plants were identified with issues that could influence safe vehicle movements and interactions during night hours or poor lighting conditions, such as fog.

Poorly set-up, operated and maintained lighting plant can impact the health and safety of workers that are undertaking activities in locations expected to be lit effectively. There is also a risk to worker health and safety when operated if they are poorly engineered or maintained.

Circumstances/observations

Mobile lighting plants are used extensively in open cut operations (as well as coal handling stockpiles and emplacement sites). These are either trailer or skid mounted and powered by a diesel engine (some driving a 415-volt three phase alternator, while others are extra low voltage (ELV supplying LED lights). Hydraulic controls are often used to raise and lower the lighting tower for transport.

The following was observed with lighting plant:

- No operational risk assessments were undertaken for the various types and models of lighting plant to ensure hazards were identified and controlled consistent with the hierarchy of control measures.
- Inadequate introduction to site systems.
- Inadequate bunding to control unwanted vehicle interaction/collision.
- Pre-start system failures, including non-existent and inadequate prestart inspections
- Fire extinguishers not maintained and no up-to-date stamped inspection tag.
- Inadequate workforce training.

1

- Some examples from 2022 shown
- Will be looking to issue more for OC coal mines in the future

Recent Publications – Investigation Info Releases (IIR)

IIR's are generally released within 21 days

Resources Regulator
Department of Regional NSW

Investigation information release

Date: February 2023

Uncontrolled dozer travels 230 metres down a ramp

Incident date: 15 January 2023

Event: Unoccupied dozer travels uncontrolled for 230 metres during plant recovery

Location: Maules Creek Coal Mine

Overview

An inoperable and unoccupied dozer was being towed by a second dozer down a mine ramp to an in-pit maintenance area, with an excavator being used as a brake stop, when a recovery sling failed and another disconnected. This resulted in the unoccupied dozer travelling uncontrolled down the ramp for 230 metres before coming to a stop on a windrow. No workers were injured.

The mine

Maules Creek Mine is an open cut coal mine 45 kilometres south-east of Narrabri in the Gunnedah basin of NSW. Maules Creek Coal Pty Ltd, a subsidiary of Whitehaven Coal Limited, is the nominated mine operator of the Maules Creek Mine.

The incident

Workers from 3 different contracting companies undertook the recovery of an inoperable Caterpillar D10T2 dozer that required it to be conveyed to an in-pit maintenance area at the mine on 15 January 2023. Initially a float was arranged to relocate the dozer but it was later identified to be unsuitable for the task and was not used.

The workers completed a job hazard assessment (JHA) that identified towing the dozer to the maintenance area using a Caterpillar 992-wheel loader, with a Caterpillar D11 dozer used as a brake stop. The JHA also required the axes of the D10 dozer to be removed for free movement of the tracks.

When the task was ready to start, the wheel loader was not available and a decision was made to deviate from the JHA and use the D11 dozer as the tow machine with a 36-tonne excavator used as a brake stop (see Figure 1). Preliminary inquiries indicate the JHA was not reconsidered and the risks arising from the work task were not reassessed once the wheel loader was no longer to be used as part of the recovery, and the function of the D11 dozer changed.

The implemented towing system involved:

- the rear of the D10 and D11 dozers being connected by a fibre recovery sling looped around their respective ripper attachments (sling 1) (see Figure 2)
- a second fibre recovery sling connecting the front of the D10 dozer to the 36-tonne excavator being positioned behind it to provide braking (sling 2)

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Department of Regional NSW

Investigation information release

Date: November 2022

Worker seriously injured during lifting activity

Incident date: 13 November 2022

Event: Worker seriously injured while using a workshop overhead crane to remove a lifting plate

Location: Tarrawonga Coal Mine

Overview

A worker suffered a compound leg fracture when he was hit by a lifting plate attached to an overhead crane.

The mine

The Tarrawonga Coal Mine is an open cut coal mine about 42 kilometres north-west of Gunnedah, NSW. Whitehaven Coal Mining Limited is the mine operator of the Tarrawonga Coal Mine.

The incident

A contract worker was removing a lifting plate after the conclusion of repairs to a haul truck. The lifting plate and the overhead crane had been used to support the weight of the axle box nose cone to allow welding repairs to be carried out on the top side of the axle box.

The lifting plate, attached to the overhead crane by a shackle and chain assembly, was being used in a vertical lift to remove it from the axle box. The plate was required to be manually manipulated out of the air vent opening of an axle box blower.

Initial information suggests that as the plate was lifted using the crane through the opening, it became wedged in the opening. The crane continued to apply load onto the plate to remove it from the hole. While under load, the plate became free and hit the worker on the leg, resulting in a serious injury.

The investigation

The Regulator has commenced an investigation to determine the cause and circumstances of the incident. The investigation will explore, among other things, working around plant, instruction, training and supervision of the worker involved, as well as the adequacy of risk assessment, work instructions and procedures relevant to the incident. The mine operator and the contractor are cooperating with the investigation. A report will be published when the investigation is concluded.

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Resources Regulator
Department of Regional NSW

Investigation information release

Date: November 2022

Worker seriously injured using a crowbar to push a securing pin on a dozer counterweight during a lifting operation

Incident date: 8 November 2022

Event: Worker seriously injured using a crowbar to push a securing pin on a dozer counterweight during a lifting operation

Location: Werris Creek Coal Mine

Overview

A worker suffered a serious laceration to his ear when he was hit by a crowbar he was using to push out a securing pin while moving a 9.8 tonne dozer counterweight.

At the time, the counterweight was held by a vertical two-leg chain assembly slung from a Franna crane. No other support device was used to prevent movement of the counterweight during the task. The securing pin was pushed by the crowbar horizontally, which released the counterweight. The counterweight rotated back about 50 mm until the chain assembly prevented the counterweight moving further. The crowbar flicked sideways due to the movement of the counterweight and hit the worker's ear.

The mine

Werris Creek Coal Mine is on Quirindi Road about 50 km south-west of Tamworth in northern NSW. The mine is an open cut coal mine and produces a thermal and PCI coal that is exported to world markets. Whitehaven Coal Limited is the mine operator of Werris Creek Coal Mine.

The incident

Three mechanical maintenance workers employed by an equipment hire and maintenance company, assisted by a Franna crane operator, commenced the task of moving the counterweight at about 9.15am on Tuesday 8 November 2022. The purpose of moving the counterweight was to enable access necessary to replace the dozer transmission.

The dozer was owned and maintained by the equipment hire company and the task was being undertaken in a maintenance area allocated to it.

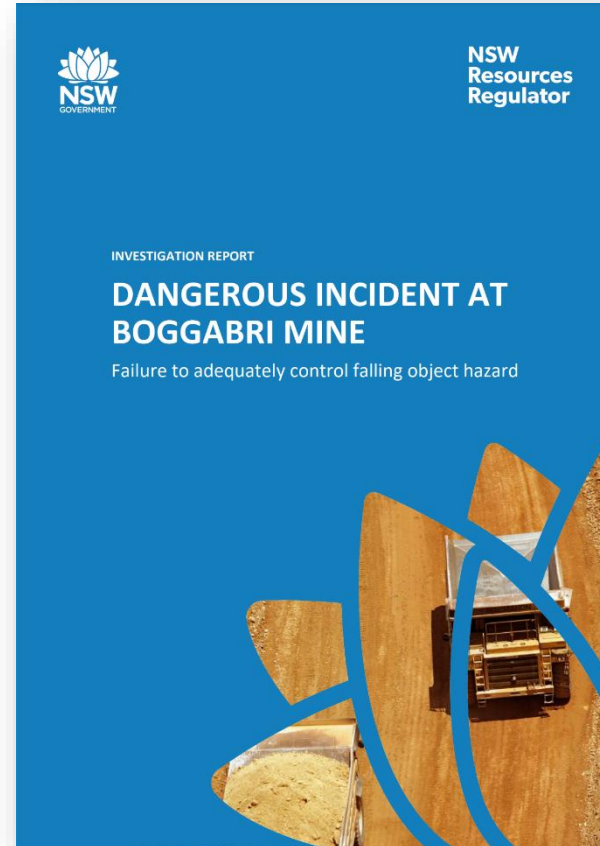
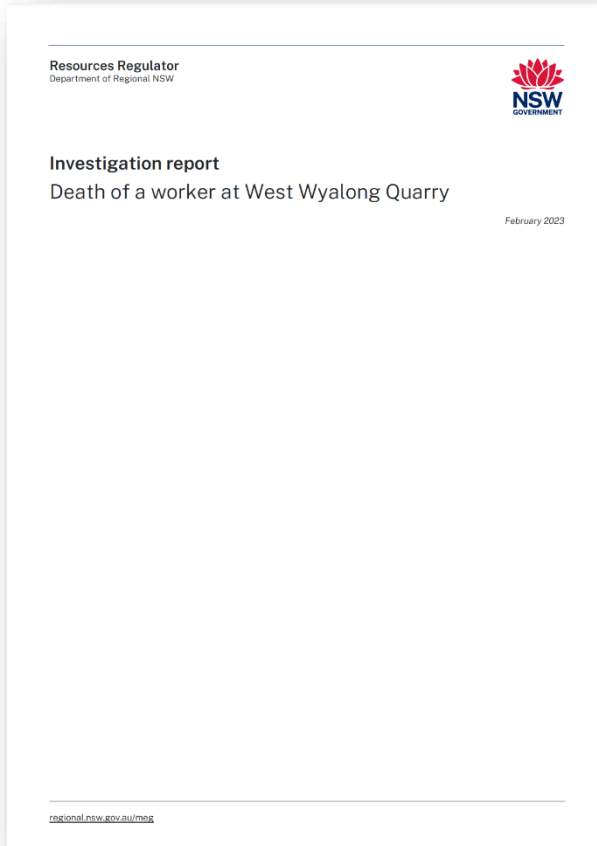
The workers created a job hazard assessment (JHA) that was counter-signed by a maintenance supervisor employed by the mine. The workers did not know the specific weight of the after-market counterweight but estimated it to be about 12 tonne by reference to generic information from the dozer OEM on-line database. There was no weight identification plate on the counterweight.

The counterweight was attached to the dozer by 2 top and 2 bottom securing pins.

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Recent Publications – Investigation Report

Released at conclusion of investigation



Collision Avoidance Forum Update

- Second forum held on 22 Feb with around 300 attendees
- Mix of industry, supplier and specialised consultants
- Next Steps:
 - Discussion paper from NSW RR
 - Will be seeking feedback on our pathway forward



Questions

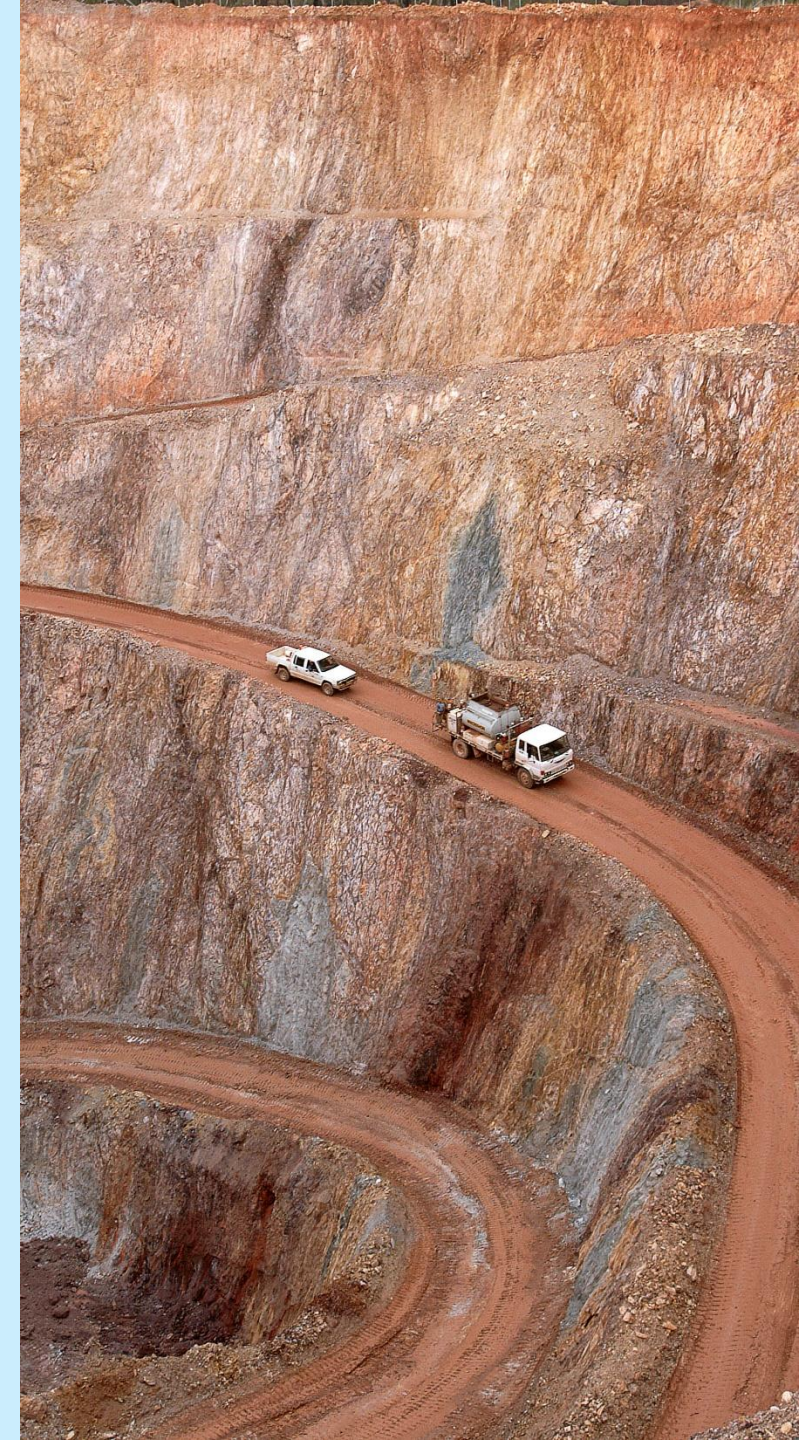


VEHICLE INTERACTIONS

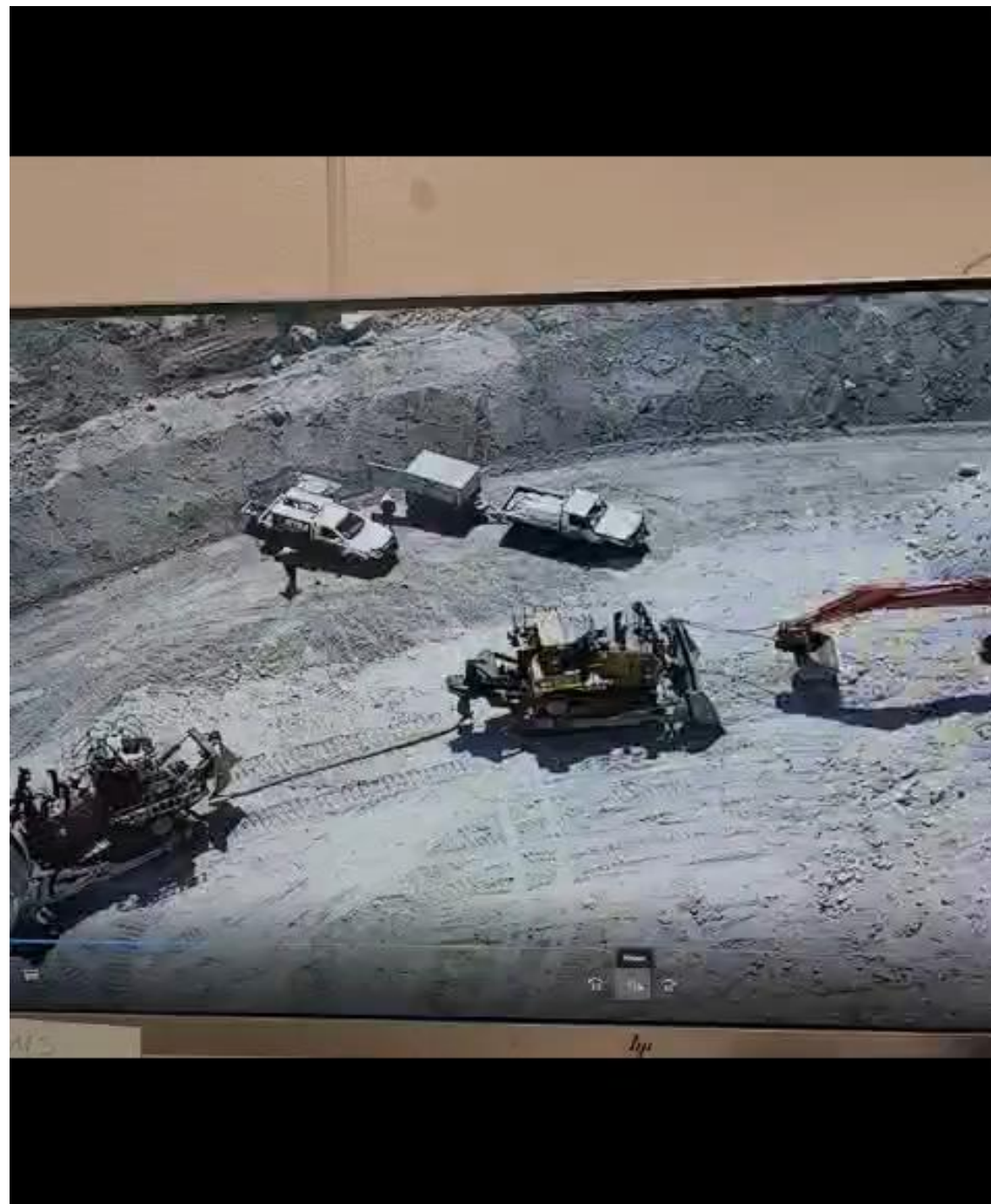
Recent Incidents in Opencut Coal Mines

Barry Coe
Inspector of Mines

March 2023



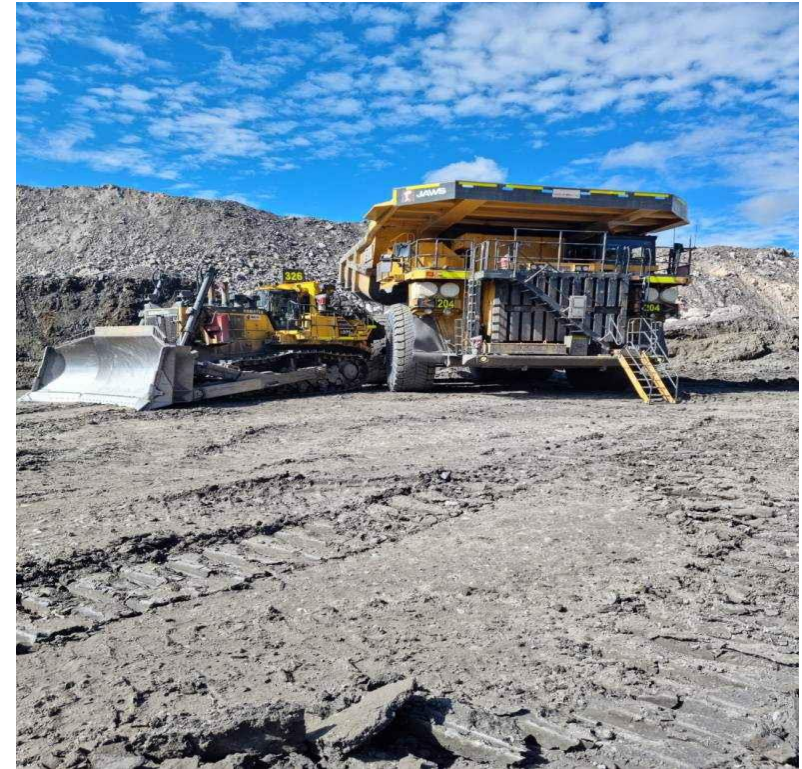
Recent Incidents



Recent Incidents



Truck Dozer Collision



Truck Dozer Collision

Recent Incidents

Rubber Tyre Dozer Contacts Electric Shovel



Recent Incidents



Failure to park vehicle safely



Light Vehicle Rollover

Near Hit incidents

Haul truck operator failed to see light vehicle.



WHAT WE ARE SEEING

Workers not following site procedures

- Not using Positive communication
- Failing to follow site road rules
- Failing to observe hazards in their work area
- Not driving to conditions
- Failing to drive defensively (**right of way given not taken**)
- Reversing equipment not having clear visibility or not looking prior to reversing.

What we are doing:

The Resource Regulator is currently conducting assessments looking at the Principal Hazard Roads and Other Vehicle Operating Areas (Dumps and Excavations areas) **(Engineering Controls)**

- Review recently reported vehicle interaction incidents.
- The use of two way radios.
- Demarcation of areas (dumps/excavation areas)
- Separation of equipment.
- Safe parking areas and the correct use.
- Separation distance trucks and mobile plant.
- Dump TARPS.
- Traffic management tools.
- Traffic rules and procedures are available and understood.
- Minimum windrow heights and width.
- Lighting plant location and protection.
- Requirements for reversing equipment.
- The use of mobile phones.
- Sites hazard reporting process.

Work Health and Safety Act 2011

Section 28 Duties of workers

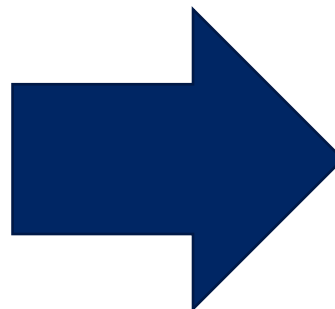
While at work, a worker must –

- a) take reasonable care for his or her own health and safety, and
- b) take reasonable care that his or her acts or omissions do not adversely affect the health and safety of other persons, and
- c) comply, so far as the worker is reasonably able, with any reasonable instruction that is given by the person conducting the business or undertaking to allow the person to comply with this Act, and
- d) co-operate with any reasonable policy or procedure of the person conducting the business or undertaking relating to health or safety at the workplace that has been notified to workers.

TECHNOLOGY DOES NOT REPLACE YOU

Sites have invested a lot of time and money, which helps but doesn't replace your duties:

- Proximity detection
- Reversing cameras
- GPS systems
- Equipment warning alarms
- Speed monitoring
- Pre-start meeting information
- Other emerging technologies



None of this technology will stop an incident if you don't:

- Use pos coms
- Drive to conditions
- Drive defensively
- Look behind when reversing
- Other safe practices that RELY ON YOU

WHAT CAN YOU DO?

Do not accept poor standards or behaviour - **SPEAK UP**

If you can't see - **STOP**

If you are not sure of site rules or unable to follow the rules –
STOP & ASK

If procedures are not appropriate - **REPORT**

If you unsure about a task – **STOP & ASK**

If equipment is defective or not fit for purpose - **STAND IT
DOWN**

Safe production - **DONT RUSH**

If you have not been trained – **NOTIFY YOUR SUPERVISOR**



QUESTIONS

Compliance Priority Report Windrows and Edge Protection

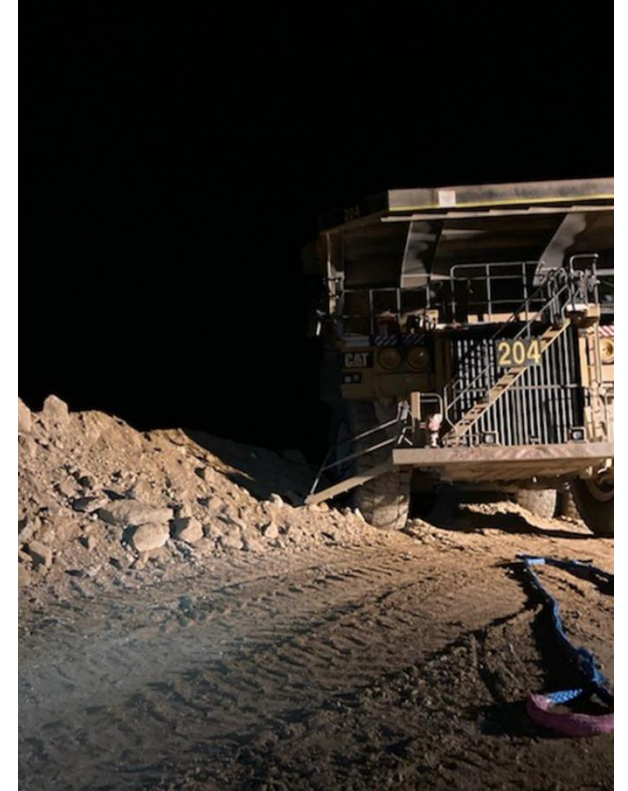
Bill McGlynn

15th March 2023



Compliance Priority Project – Windrows and Edge Protection

(Incident photos from NSW Coal 2022)



Compliance Priority Project – Windrows and Edge Protection

Several key elements were assessed as part of this program and included:

- Identification of higher risk dumps.
- Implementation of controls on higher risk dumps and worker knowledge.
- Documented standards for windrows and how compliance is monitored.
- Site compliance to own standard within mining areas.

Geotechnical TARP - Dumps			
Normal State	Dump height <20 metres (>30% material sourced from below GN and/or alluvial) competent material, no water at the toe, no movement observed, adequate lighting Dump height <25 metres (<30% material sourced from below GN and/or alluvial) competent material, no water at the toe, no movement observed, adequate lighting Dry clean floor <4° dip out of dump toe Dumping into water <2m deep if all material is fresh conglomerate in dump (i.e. material being dumped, the material being dumped on to and any block tip below)		
Trigger Action Response Plan	Level 1 Trigger – Alert / Investigate	Level 2 Trigger – High Alert / Rectify	Level 3 Triggers – Stop – Withdrawal / Removal
	Floor >4° dip out of dump toe Material being dumped is weak or weathered or wet Visible settling cracks >100mm 5-10 metres from the tip head Routine geotechnical inspection indicates deviation from Normal conditions Incompetent dump floor at toe	Dump height >25 metres Dumping over a highwall Dump toe bulging Water seeping from the dump face or toe Dumping into water (except above green TARP exception) Rainfall >20mm in last 24 hours Steeply dipping dump toe floor horizon	Dump height >30 metres Dumping incompetent material into water or mud Dump failure Rapidly opening cracks Floor heave
Persons affected	Action / Response	Action / Response	Action / Response
All Personnel	Inform Mining Supervisor and ensure Windrows increased to 2 metres minimum Trucks to tip 5m short of the windrow Weaker material is dispersed along tip head Monitor tip area and notify supervisor of any changes in condition	Stop dumping in the immediate area and inform Mining Supervisor	Close dump and contact Mining Supervisor immediately
Mining Supervisor	Increase inspection frequency of dump conditions Notify all affected personnel of condition Assign fully competent, experienced dozer operator to dump Report any change in conditions or TARP level to the next shift & include in statutory shift report	Conduct risk assessment and alter TARP signage Ensure all persons who are required to enter the area have read and signed the risk assessment and understand the TARP condition Consult with Mine Geologist on post-rainfall conditions if required	Prevent all access to affected area Notify Mine Geologist Report incidents through CMO Be involved in recovery plan and execution
Mine Geologist	Complete inspection of the area as soon as practical Notify Mining Supervisor of altered conditions Undertake ongoing inspection and monitoring as required	Provide advice to Mining Supervisor post rainfall event if required Perform routine geotechnical inspection post >20mm rainfall event - production not required to await this inspection Inform Mining Supervisor after inspection Seek additional direction from external consulting geotechnical engineer as required Update Mine Hazard Plan and Site Geotechnical Register Assist with identifying control/recovery measures	Conduct inspection as soon as possible Inform Mining Supervisor of results of inspection Be involved in development of a recovery plan
Mining Engineering Manager (MEM)	Review information	Approve recovery and remediation plans	Approve recovery plan Make internal and external notifications as required

Compliance Priority Project – Windrows and Edge Protection

Findings

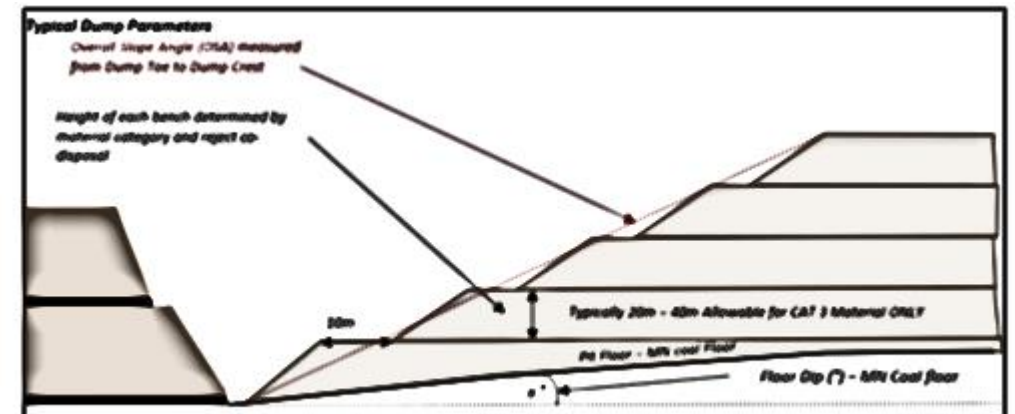
- Processes for administering additional controls for non-standard or higher risk dumps.
 - JSA's / JHA requirements with the triggers listed in the dumping procedure.
 - All triggers and standardised controls listed in TARPS.
- Some sites signposting the risk ranking (including green) on every dump while others just signpost the higher risk dumps (JSA in place or yellow / orange/ red)
- Methods for ensuring that dump windrows were to minimum standard height included:
 - Measuring relative to a known level on a dozer blade (such as red marker plate welded on to the rear of the blade).
 - Marker tape on light vehicle flag poles out in front.
 - Life sized murals at the pre-star room to remind workers what 1.8m looks like.



Compliance Priority Project – Windrows and Edge Protection

Recommendations (1/2)

- Mine design guidelines include dumps – dump height limits for material type, overall slope angle, consideration of floor dip, material ratio requirements, reject co-disposal requirements (ratios, cells etc.)
- Geotechnical checklists for dumps that are completed by appropriately qualified personnel and with the requirement for re-assessment with a change in parameters, including material composition.
- Geotech hazard awareness training for all pit workers.
- Dump TARPS and JSA's require technical review when there has been evidence of instability, especially on high risk dumps.
- 24/7 TARPs for 24/7 operations - Triggers and controls still effective when managers and technical staff are offsite.
- Rainfall / period is included in TARP or JSA triggers.



Where the floor dips greater than 10° , maximum overall slope angle is to be reduced in accordance with the chart below

Compliance Priority Project – Windrows and Edge Protection

Recommendations (2/2)

- Control room operator knowledge of TARP / JSA controls e.g. only certain materials or experienced operators on higher risk dumps.
- Control room operator protocols for changing the plan.
- Dumps to be blocked off with a windrow when they are not planned to be active and have not been inspected.
- Lighting plant positioning for maximum visibility and without blinding light.
- Methods for dozer operators and supervisors to indicate windrow height requirement.
- Having a procedure for filling out the corners.



Compliance Priority Project – Windrows and Edge Protection

QUEENSLAND Resources Safety and Health – Coal Inspectorate | Alert | No.411 – *Truck rolls down dump face after breaching tip head bund.* (JULY 2022)

What happened

A CAT 789 haul truck backed position 5 and 6 wheels through a safety berm on an overburden dump during a night shift. After teetering for a brief period at the tip head, the truck rolled side-over-side for two complete revolutions, before finally coming to rest 26.7m below on its wheels. The driver sustained injuries that required hospitalisation overnight.

Key issues

- The tip head was not to standard, being too narrow and misaligned, resulting in the truck backing up at an angle to the edge.
- The height of the windrow was well below the half wheel height of the truck involved.
- The width of the windrow was below the mine standard.
- The height of the dump had exceeded the maximum mine standard.
- The position of lighting was inadequate, resulting in shadows on the off-driver's side of the truck where the berm was first breached.



NSW 2014



In closing

- Open Cut Blasting Forum 24th May 2023
- Next OC Coal MEM Forum 27th June 2023
- Two Day MEM Safety Seminar 18th and 19th October 2023
- **QR Code at the end of the survey**