GOVERNMENT OF WESTERN AUSTRALIA

Department of **Local Government, Industry Regulation and Safety**

WorkSafe Western Australia

October is Safe Work Month

Safe work is for *life*

Webinar – Safe Work Month 2026

Critical risk management



Acknowledgement of Country

The Department of Local Government, Industry Regulation and Safety (LGIRS) respectfully acknowledges Aboriginal peoples as being the custodians of Western Australia.

We acknowledge the enduring connection Aboriginal people continue to share with the land, sea and sky through both their ancestral ties and custodianship to Country.

We pay our respect to Elders both past and present, and acknowledge the value brought to our department through the collective contribution of Aboriginal and Torres Strait Islander peoples across Western Australia.



GOVERNMENT OF WESTERN AUSTRALIA

Department of **Local Government, Industry Regulation and Safety**

WorkSafe Western Australia

October is Safe Work Month

Safe work is for *life*

Marianne Amato



Join at

Slido.com

#CRM



GOVERNMENT OF WESTERN AUSTRALIA

Department of **Local Government, Industry Regulation and Safety**

WorkSafe Western Australia

October is Safe Work Month

Safe work is for *life*



Overview of Major Hazard Facilities regulation and critical risk management

Luke Van Baaren

Seveso Italy

- Chemical plant for producing herbicides and disinfectants
- Located in a semi-rural area 2km from the centre of the town
- Significant dioxin release on 10 July 1976
- 37,000 people exposed, no immediate fatalities
- Thousands of livestock killed and 80,000 culled
- Significant soil contamination

Bhopal India

- Chemical plant producing pesticides
- Located near the city centre, in a highly populated area
- Methyl Isocyanate release on 2-3 December 1984
- At least 15,000 direct fatalities
- 500,000 exposed with ongoing health issues
- Soil and water contamination

Do major incidents still happen?







Do major incidents still happen?





Do major incidents happen in Australia?





Do major incidents happen in WA?





Introduction

- Team Leader of the Major Hazard Facility branch (MHF)
- We exist to protect society from the impact of major industrial incidents
- We do not regulate workplace safety
- Presentation introducing regulatory oversight applied to MHFs WA
- This presentation will assume an audience with little knowledge of MHFs

Scope for the MHF section

- Seveso/Bhopal and similar kicked off a worldwide response, and the creation of major hazard facilities. Including UN Convention C174
- The *Dangerous Goods Safety Act 2004* exists to protect people, property and the environment
- The focus on the low probability, high consequence incidents
- Consideration of the impact on the public (land use approvals)
- Security is an important aspect
- MHFs require approval to operate (through licensing and safety report)

Definition of an MHF

- To be an MHF, first the facility must be classified
- The process considers:
  - the quantity and properties of specifically named substances
  - the circumstances of how the substances are stored, handled or transported
  - the potential impact from an incident
  - other legislation in place
- Generally, the complex processing facilities with a high potential consequence end up classified as MHFs in WA

The regulation of MHFs

- The MHF branch is not a ‘compliance-based’ regulator
- Nor are we a ‘performance-based’ regulator
- We apply ‘regulated self-assurance’ through a safety case regime
- Focus on major incidents, technical safety (safety critical controls), safety management system

Example 1 – Flame detectors

- Scenario – a flammable gas processing facility
- Is fire detection required? What type and how many? Where should they point?
- Will they work when required?
- What do they do on detection of a fire? What executive action needs to occur?
- Will the ESD and vent valves work when required?
- How quickly do the vent and ESD valves act?

Example 2 – Temperature transmitter

- Scenario – a facility which pipes cryogenic liquid to a storage tank
- What is the required accuracy and calibration frequency of a TT?
- What executive action to take on hi temp? How quickly is the control room expected to act?
- What is the potential consequence from a spurious high reading?
- What level of reliability is required? Will it work when required?
- Is it actually that important?

Aerial view of a collapsed ammonia storage tank





How are MHFs regulated?

- Dedicated team of specialist engineers and chemists
- Not licensing in the first place if the risk is not in the public interest
- Consultation on land use planning
- Focus on process safety and technical risk: technical studies, risk assessments and approval of a safety report
- Risk-based oversight: frequent inspections, systems audits and reviews
- Pushing for continuous improvement

Join at

Slido.com

#CRM



GOVERNMENT OF WESTERN AUSTRALIA

Department of **Local Government, Industry Regulation and Safety**

WorkSafe Western Australia

October is Safe Work Month

Safe work is for *life*



Petroleum Safety in Western Australia: Managing risk, compliance and safety performance

Vaughn Hinkley

Petroleum Safety: Why it matters

Petroleum safety in Western Australia protects:

- our people
- our workplaces
- our communities
- our environment



What we do • the hazards • how we manage risk • what the law requires

What do petroleum operators actually do?

From resource to product

Explore

↓

Drill

↓

Produce

↓

Store / transport

↓

Decommission

Petroleum operations may include

- onshore facilities
- offshore facilities
- diving operations
- vessel operations
- drilling operations
- production facilities
- pipelines
- maintenance and decommissioning
- processing
- storage and transfer



Why is petroleum different?

Petroleum can involve high energy hazards

- 🔥 Fire
- 💥 Explosion
- ⛽ Hydrocarbon release
- 🌫️ Toxic / hazardous gases
- ⚙️ Pressure and stored energy
- ⬆️ Working at height
- 🚧 Vehicles and mobile plant



The challenge – a small failure can potentially have large consequences

The law: Who are we protecting?

The WHS Act protects more than workers

The WA WHS framework protects:

- Workers
- contractors
- visitors
- members of the public
- other people who may be affected by work

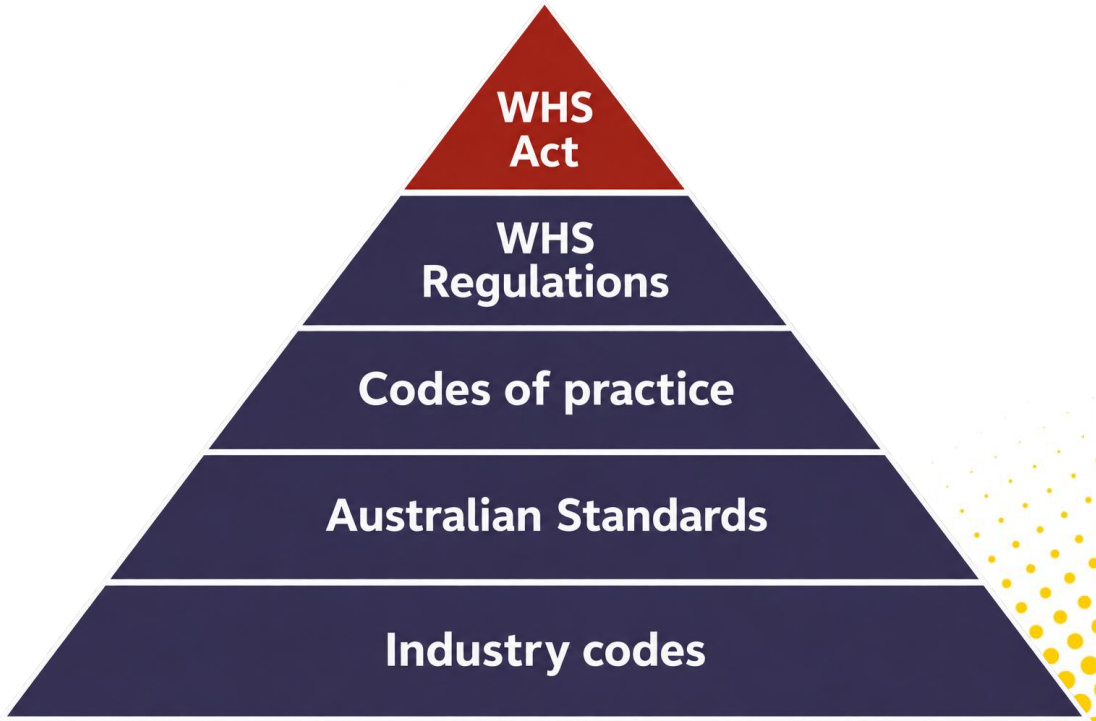


Key principle: Eliminate or minimise risks arising from work

The Western Australian WHS framework

The legal framework

1. *Work Health and Safety Act 2020*
2. WHS Regulations
3. Petroleum-specific regulations – Work Health and Safety (Petroleum and Geothermal Energy Operations) Regulations 2022
4. Codes, guidance, standards and industry practices



Who is responsible for safety?

Everyone has a role

Operator / PCBU
Provide safe systems
Manage risks
Provide resources
Consult workers

Officers / person making decisions
Due diligence
Understand hazards
Verify controls
Monitor performance

Workers
Take reasonable care
Follow reasonable instructions
Report hazards
Cooperate

AND
Contractors are part of the safety system



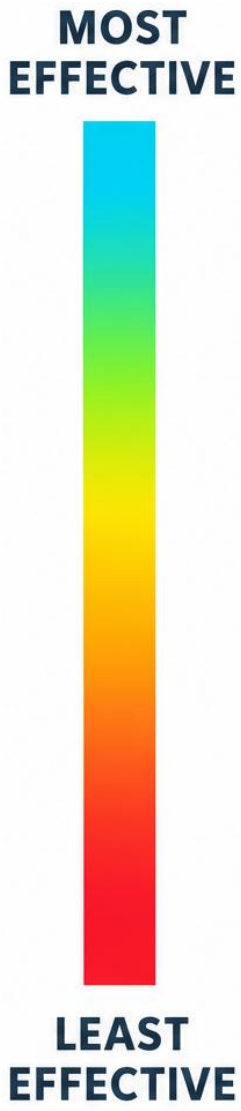
How do we manage risk?



Ask five questions

1. What can go wrong?
2. How bad could it be?
3. How likely is it?
4. What controls do we have?
5. Do the controls actually work?

The hierarchy of controls – control the hazard



Eliminate
Remove the hazard

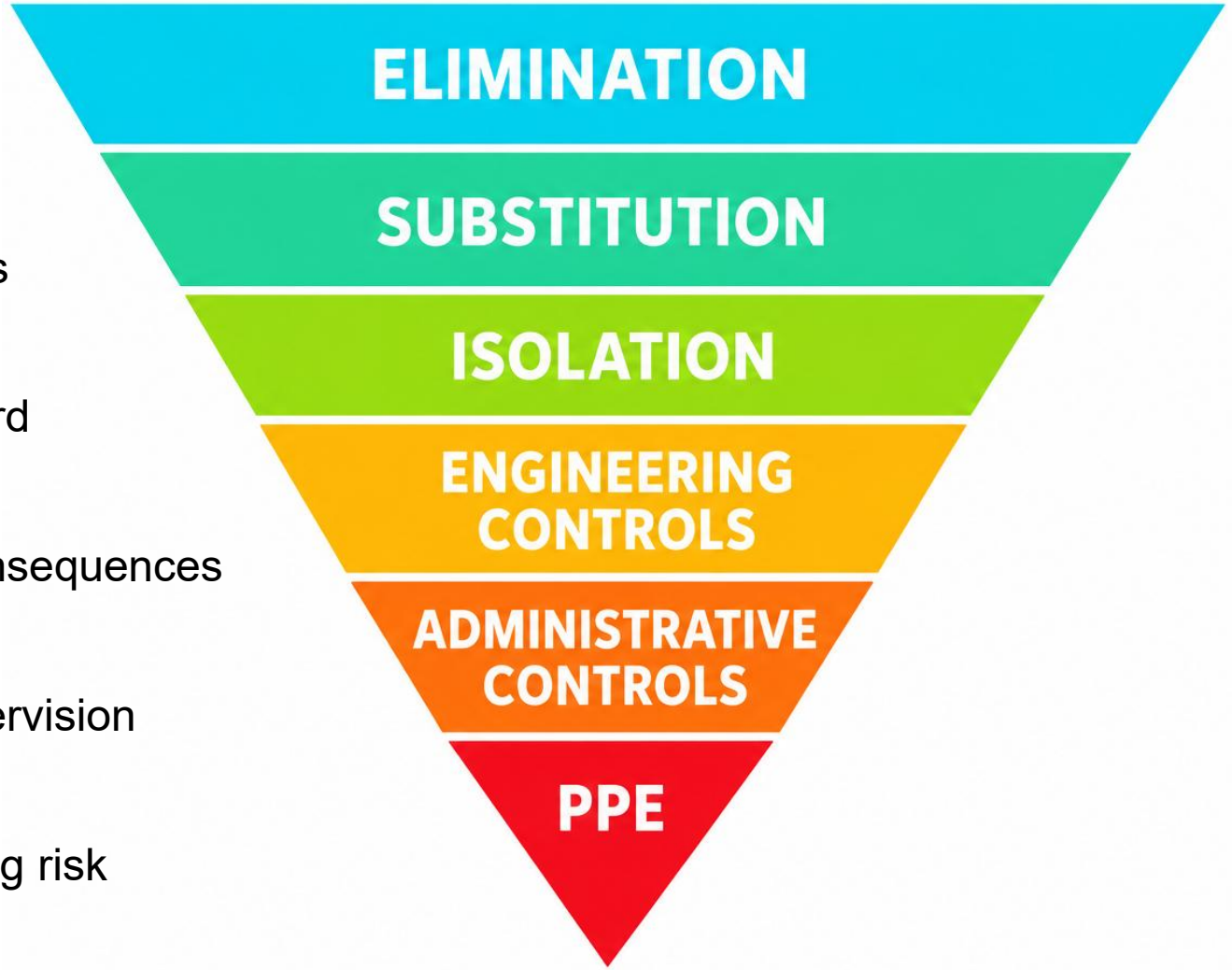
Substitute
Use something less hazardous

Isolate
Separate people from the hazard

Engineering controls
Design the hazard out or reduce its consequences

Administrative controls
Procedures, training, permits or supervision

PPE
Protect the individual from remaining risk



Major accident hazards – we plan for big events

Potential major accidents can include:

- Major fire
- Explosion
- Major hydrocarbon or gas release
- Loss or containment
- Blowout
- Structural or equipment failure



Our approach: Prevent → detect → control → respond → recover

The safety case regime

How does an operator demonstrate safety? The safety case.

A safety case describes:

- the facility
- the activities
- safety studies
- identified hazards and risks
- safety management arrangements
- emergency response arrangements



Key point: A safety case must be in force before petroleum or geothermal energy operations commence or are undertaken. This is a risk-based strategy.

Safety doesn’t stop when the facility starts

Safety is a living system

Design
↓
Construct
↓
Commission
↓
Operate
↓
Maintain
↓
Modify
↓
Decommission

At every stage:
Identify → Assess → Control → Verify



Emergency response

What if something goes wrong?

Detect

Alarms / monitoring

↓

Protect

Emergency shutdown / isolation

↓

Respond

Emergency teams

↓

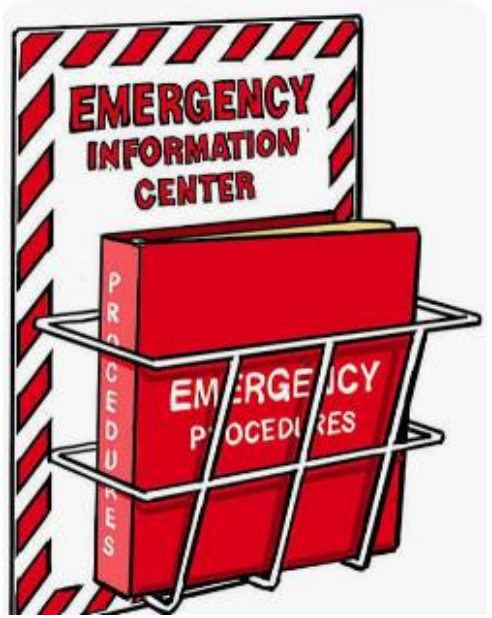
Evacuate / muster

Move people to safety

↓

Communicate

Workers • Emergency services • Community where appropriate



What operators do every day



Safety is in the daily work.

Operators and workers:

- inspect equipment
- test safety systems
- maintain plant
- monitor processes
- conduct risk assessments
- manage permits and isolations
- investigate incidents and near misses
- train and verify competence
- consult workers
- manage changes
- audit performance
- improve controls

The human factor



People are part of the safety system.

People can:

- detect problems
- challenge unsafe conditions
- identify changing conditions
- make decisions
- stop work
- learn from incidents

But people can be affected by:

- fatigue
- pressure
- poor communication
- inadequate information
- complex procedures
- poorly designed systems

Key principle: Design the system so people can succeed safely

What does this mean for the public?

Petroleum safety is a community issue

The public should expect operators to:

- understand their hazards
- manage risks
- maintain safety systems
- use competent people
- monitor performance
- comply with registration
- learn and improve

The public can help by:

- staying outside restricted areas
- following signs and barriers
- following emergency instructions
- reporting damage and hazards
- not interfering with safety equipment



Speak up: Safety culture



Good safety culture

- Speak up
- Ask questions
- Report hazards
- Challenge unsafe conditions
- Stop when necessary
- Learn from incidents

Production matters.
People matter more.

Production matters.
People matter more.

Operator • Worker • Community

Safety works when we work together

Operator
Provide safe systems
Identify hazards
Maintain controls
Prepare for emergencies
Consult

Workers
Follow safe systems
Identify hazards
Speak up
Report concerns
Participate

Community
Follow warnings
Stay clear of hazards
Follow emergency instructions
Report concerns
Stay informed



What good petroleum safety looks like

Good safety = prevention + preparedness + learning

Prevent
Identify hazards and control risks

Prepare
Plan for emergencies and failures

Verify
Check that controls actually work

Learn
Investigate incidents and improve

Repeat
Safety is continuous



Five takeaways



Five things to remember

1. Petroleum operations can involve significant hazards
2. Risks must be identified and controlled
3. WA law protects workers and other people who may be affected by the work
4. Operators must demonstrate how petroleum risks are managed
5. Safety is everyone’s responsibility

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Local Government, Industry Regulation and Safety**

WorkSafe Western Australia

October is Safe Work Month

Safe work is for *life*

Principal Mining Hazard (Critical Risk) Management in the Western Australian mining industry

Gary Cresswell



Introduction

- Team Leader for WorkSafe Mines Safety Directorate – South Region
- We administer the *Work Health and Safety Act 2020* and Work Health and Safety (Mines) Regulations 2022
- I will discuss the following:
  - The role of WorkSafe Mines Safety
  - Requirements for a mine safety management system (MSMS)
  - What is a principal mining hazard?

Role of WorkSafe



What is WorkSafe's vision for work health and safety?

Healthy and safe workplaces in Western Australia.



What is our goal?

To reduce work-related fatalities and the incidence of serious injuries and illnesses.



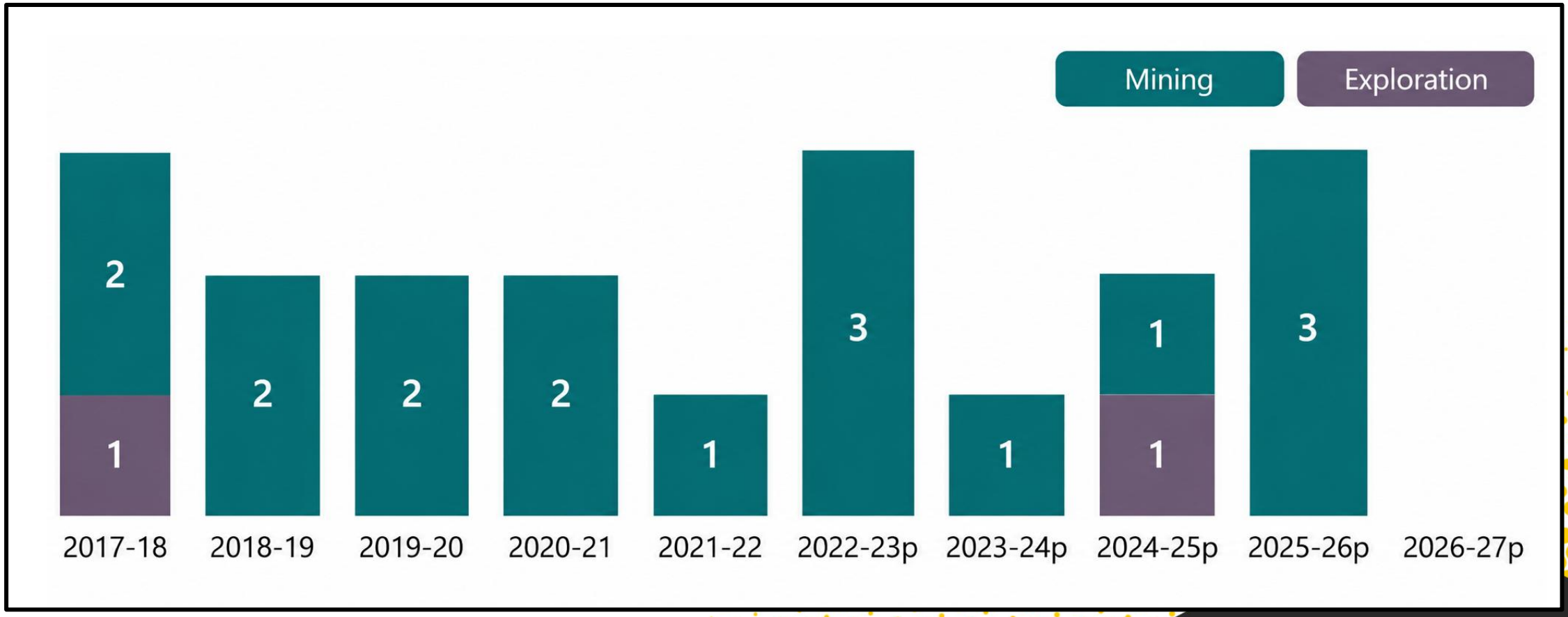
What is the role of WorkSafe?

To drive workplace change through education, specialist advice and enforcement.

WorkSafe Mines Safety

- WorkSafe Mines Safety educates and promotes safe occupational practices to the mining industry.
- The role of WorkSafe Mines Safety is to inspect mining operations to ensure the work health and safety of mining workers.
- Investigate mining incidents, follow up complaints and provide advice to enquiries made by mine workers

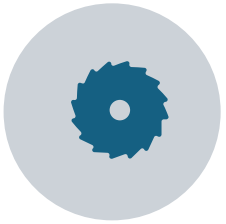
WA mining fatalities: 2017 to current



Mining fatality types: 2015 – 2026



TRAFFIC MANAGEMENT (23)



CRUSH INJURY (22)



FALL FROM HEIGHT (13)



FALLING OBJECT (5)



ROCK FALL (5)



HEAT EXHAUSTION (4)

Mine safety management system

- The MSMS is the primary means of providing processes and methods to everyone involved at a mine to ensure the safe operation of a mine.
- It is a framework that brings together the mine’s policies, systems, procedures and plans to enable a mine operator to follow a systematic approach to achieving, improving and monitoring a desired level of health and safety.

WorkSafe MSMS Info

Ensuring system effectiveness

Processes must be in place for measuring how the mine's MSMS is performing against set performance standards. The MSMS must include the following:

- performance standards for measuring the effectiveness of all aspects of the MSMS.
- a system for auditing the effectiveness of the MSMS against the performance standards, including the methods, frequency and results of the audit process.

Performance standards

- Performance standards measure the level of effectiveness of business activities aimed at minimising risks to health and safety to persons in the workplace.
- Dependent upon what aspects of work health and safety performance are being measured, the evaluation may demonstrate:
  - historical work health and safety performance and trends
  - compliance with legal obligations
  - visible commitment in the provision of duty of care responsibilities
  - adoption of best practices commonly used within the industry.

What is a principal mining hazard

- What is a principal mining hazard (PMH)?

  Any activity, process, procedure, plant, structure, substance, situation or other circumstance relating to the carrying out of mining operations at the mine that has a reasonable potential to result in multiple deaths in a single incident or a series of **recurring incidents.**

- Often referred to as low probability - high consequence events.

"A series of recurring incidents refers to the type of incidents that have the potential to recur because workers will continue to be exposed to the same hazard.

Heavy and light vehicles interaction is an example of a recurring hazard. Sometimes only one or two workers are exposed to the interaction of heavy and light vehicles at any time but if the same work needs to be done on a recurring basis, this may give rise to a series of recurring incidents."

Principal mining hazard

Legislated PMH considerations

- instability of geotechnical structure
- inrush of any substance
- mine shafts and winding system
- roads or other areas where mobile plant operate.
- fire or uncontrolled explosion
- gas outbursts in an underground coal mine
- spontaneous combustion in an underground coal mine
- any other hazard identified by the mine operator.

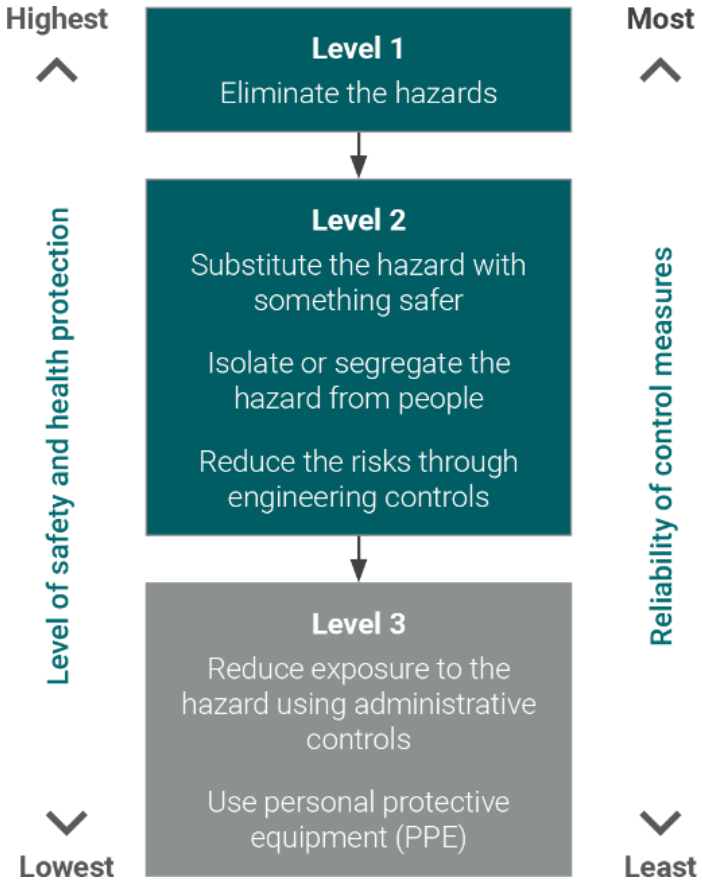
Other PMH considerations

- Air quality or dust or other airborne contaminants (Asbestos, silica, radiation, mercury, arsenic, cyanide, lead, diesel particulate, welding fume CO, CO2 NOX H2S etc.)
- Structural integrity/failure
- Lone and isolated work
- Arc flash/electrocution
- Natural Disaster – flood, cyclone/storm, and earthquake
- Proximity to old workings
- Uncontrolled release of pressurised hazardous chemical
- Working at heights
- Working in confined spaces.

PMH risk assessment

- Once a PMH has been identified, the mine operator must use appropriate risk assessment methods to investigate and analyse each PMH identified before developing the PMHMP.
- Each method and analysis process or technique has limitations and requires different levels of resources and detail. Some processes may be better suited to particular PMHs and types of mining operations than others.
- Whatever the process chosen for a PMH, it should be logical, comprehensive, systematic and repeatable if it is to be effective.

Risk control



- Control Measures are acts, objects (engineered) or systems (combination of act and object) that prevent or mitigate an unwanted event.
- Control measures must:
  - be effective at eliminating or reducing the risk
  - be designed appropriately for their purpose
  - suitable for the type and duration of the work
  - Installed or put in place / set up
  - used correctly
  - maintained to ensure it remains effective

Each of the criteria above are a requirement of r.37

Control criticality

- Controls that are crucial to preventing or mitigating the consequences of a PMH are referred to as critical controls.
- The absence or failure of a critical control will significantly increase the risk of an PMH occurring, despite the existence of the other controls.
- Verifying critical controls are in place and effective ensures PMH risks are eliminated or minimised so far as is reasonably practicable.

Control effectiveness

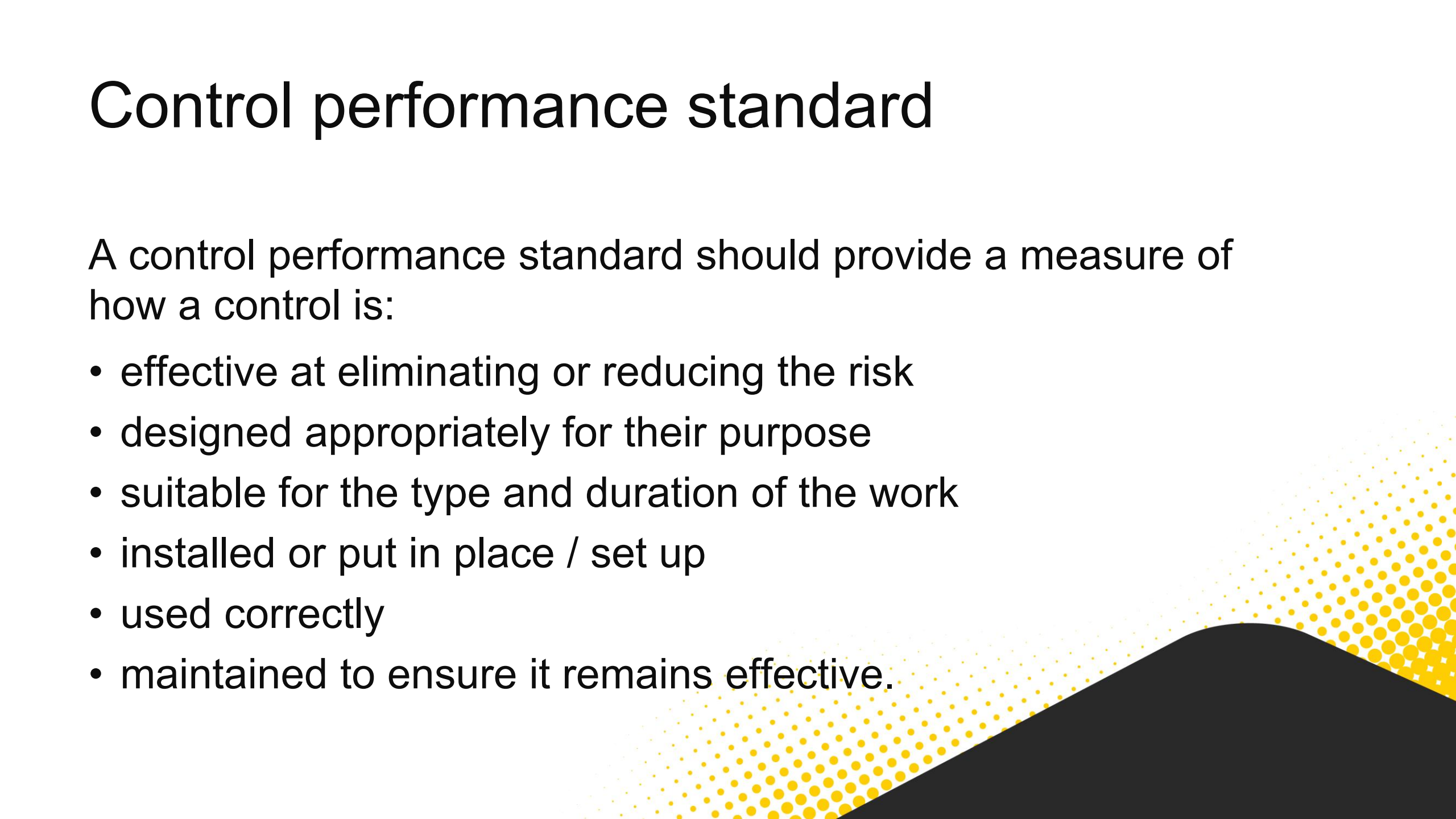
- For all control measures, a range of performance indicators is required, particularly for those controls deemed critical. The performance indicators measure both how well the controls are performing and how well the management system is monitoring and maintaining the controls.
- This forms part of the performance standards required within the MSMS.



Control performance standard

A control performance standard should provide a measure of how a control is:

- effective at eliminating or reducing the risk
- designed appropriately for their purpose
- suitable for the type and duration of the work
- installed or put in place / set up
- used correctly
- maintained to ensure it remains effective.



PMH management plan

- What is a PMH management plan (PMHMP)?

  A plan that documents how risks to health and safety of a person arising from principal mining hazard will be eliminated or mitigated as far as is reasonably practicable.

- The mine operator must prepare a PMHMP for each PMH that has been identified at the mine.

PMH management plan

The PMHMP must:

- identify and describe the hazard at the mining operation
- assess the risks of health and safety to workers from exposure to the hazard
- describe the control measures and implementation required to manage the risks associated with the hazard
- provide for the management of all aspects of the risk controls relevant to the PMH
- be set out and expressed in a way that is easily understandable and made readily accessible for management, supervision and workers who use the PMHMP

PMHMP review

The PMHMP should be reviewed following:

- a control measure is found to be ineffective
- a significant change to the workplace, work environment, system of work or procedures
- identification of a new hazard or risk
- consultation under WHS laws indicating a review is required
- an event specified in the PMHMP as requiring review
- an MSMS audit identifies a deficient control measure
- a request from a health and safety representative or
- a notifiable incident occurring

When things go wrong …

The value of a **good investigation**:

- identifies root causes – determines how and why the incident occurred
- prevents recurrence – identifies effective correction actions
- strengthens controls – tests existing controls and identifies gaps
- drives improvement – converts incidents and near misses into lessons that improves systems, processes and practices
- builds trust and accountability – drives continuous safety improvement

Summary

- **MSMSs set the framework**
  They establish how risks are identified, controlled, monitored and continuously improved.

- **PMHMPs turn the framework into effective controls**
  Critical controls must be designed, implemented, verified and maintained in the field. Learn and adapt from incidents.

Work Health and Safety
EXCELLENCE AWARDS **2026**

Register here:

Join at

Slido.com

#CRM



Email safetycomms@lgirs.wa.gov.au if we couldn’t respond to your question in today’s session

Stay in touch

The Department provides a range of newsletter and information products to keep you up to date.


www.worksafe.wa.gov.au/subscribe


WorkSafe WA


WorkSafeWA


WorkSafeWA