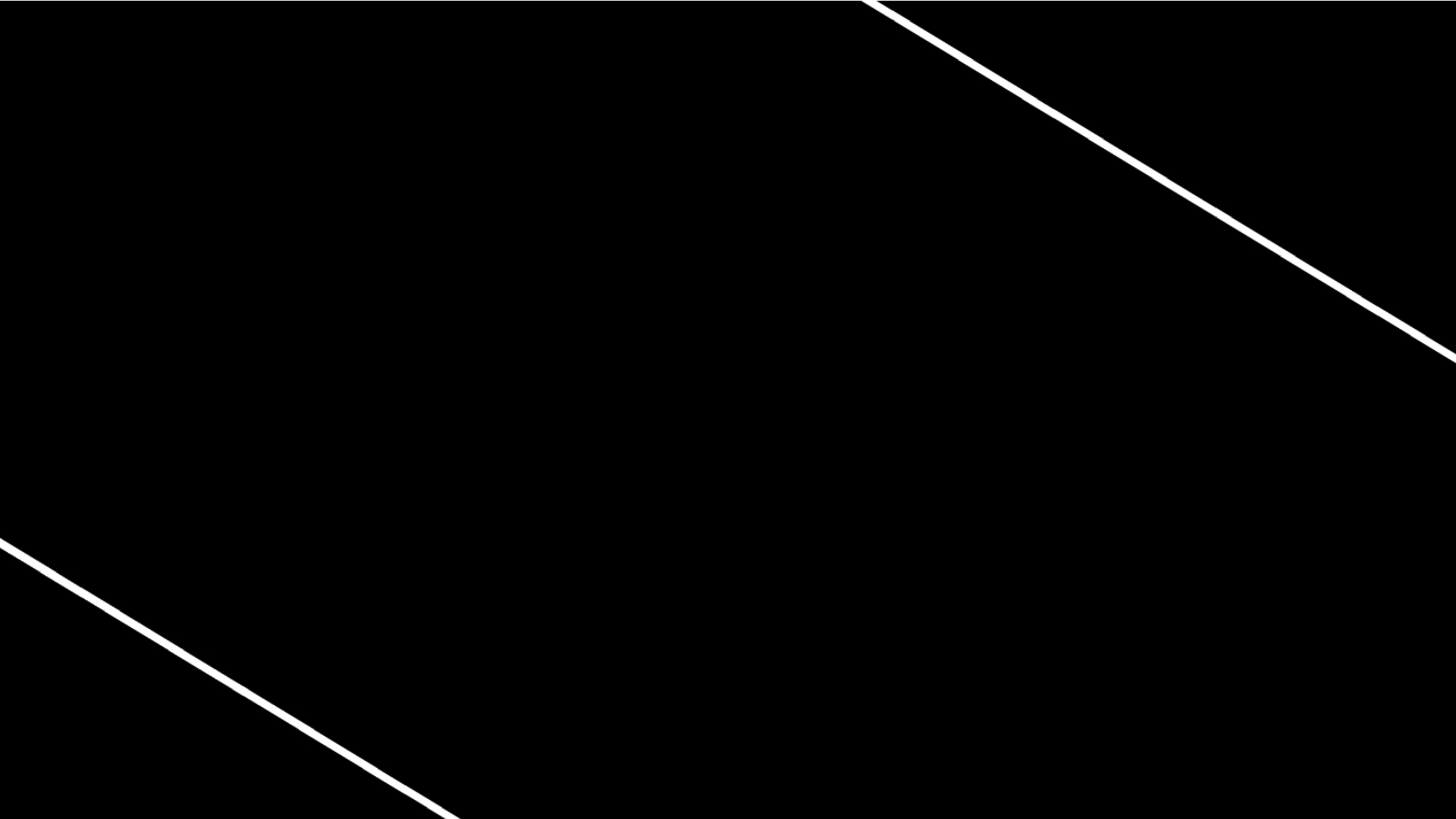


# From Reactive to Resilient

## *Establishing a Critical Risk Management System*



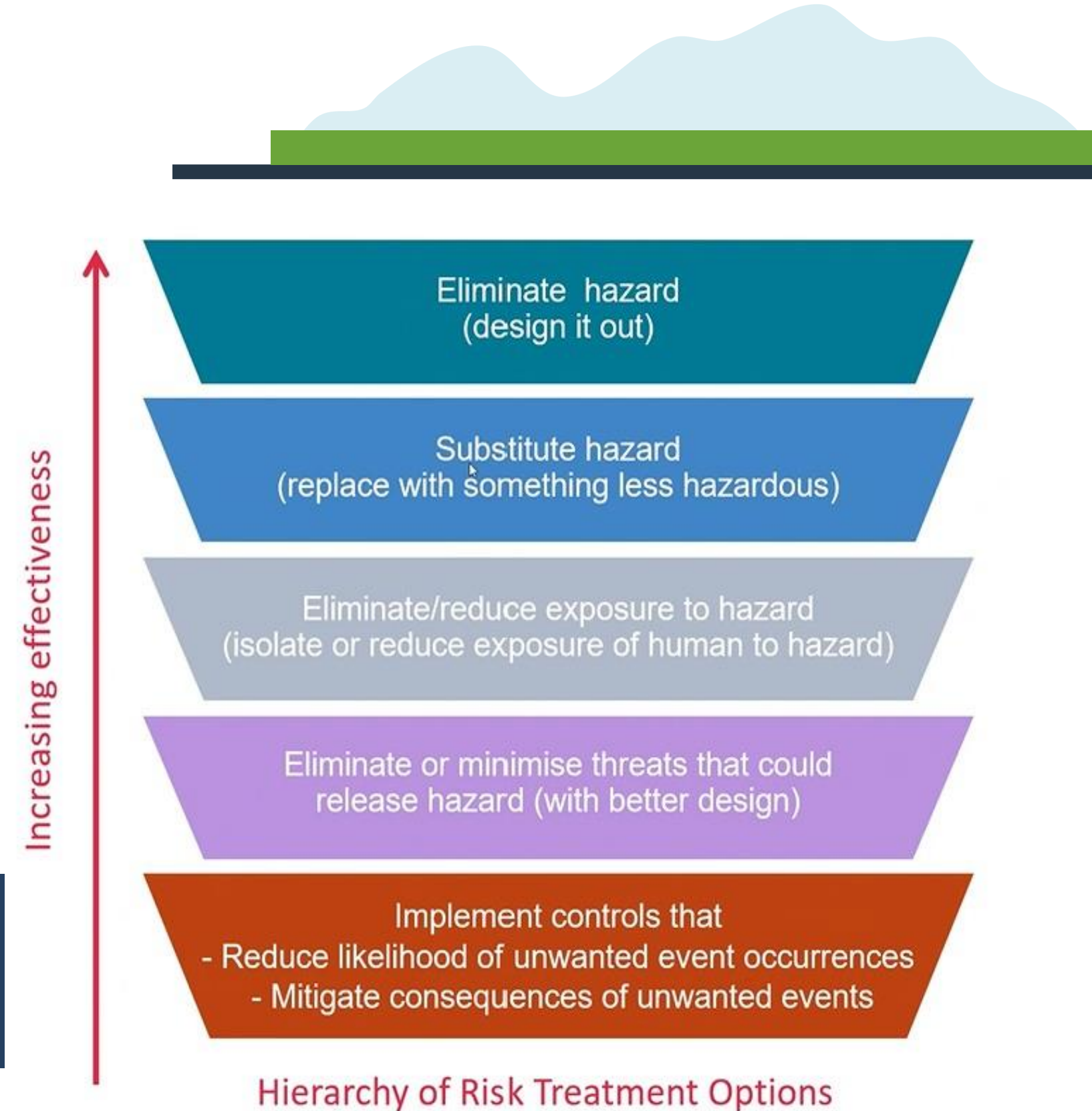


# What is a Critical Risk Management System?

A Critical Risk Management System is a structured approach that focuses on three things:

- Identifying Critical Risks (those with potential for fatalities)
- Defining Critical Controls and their Performance Criteria
- Verifying the effectiveness of the Critical Controls in the field

Unlike traditional safety programs that try to address all risks equally, Critical Risk Management prioritises the prevention and mitigation of fatal and catastrophic events.



# Why Implement Critical Risk Management?

## Industry Risk Profile

Mining and quarrying operations inherently involve high-consequence hazards that require systematic management approaches

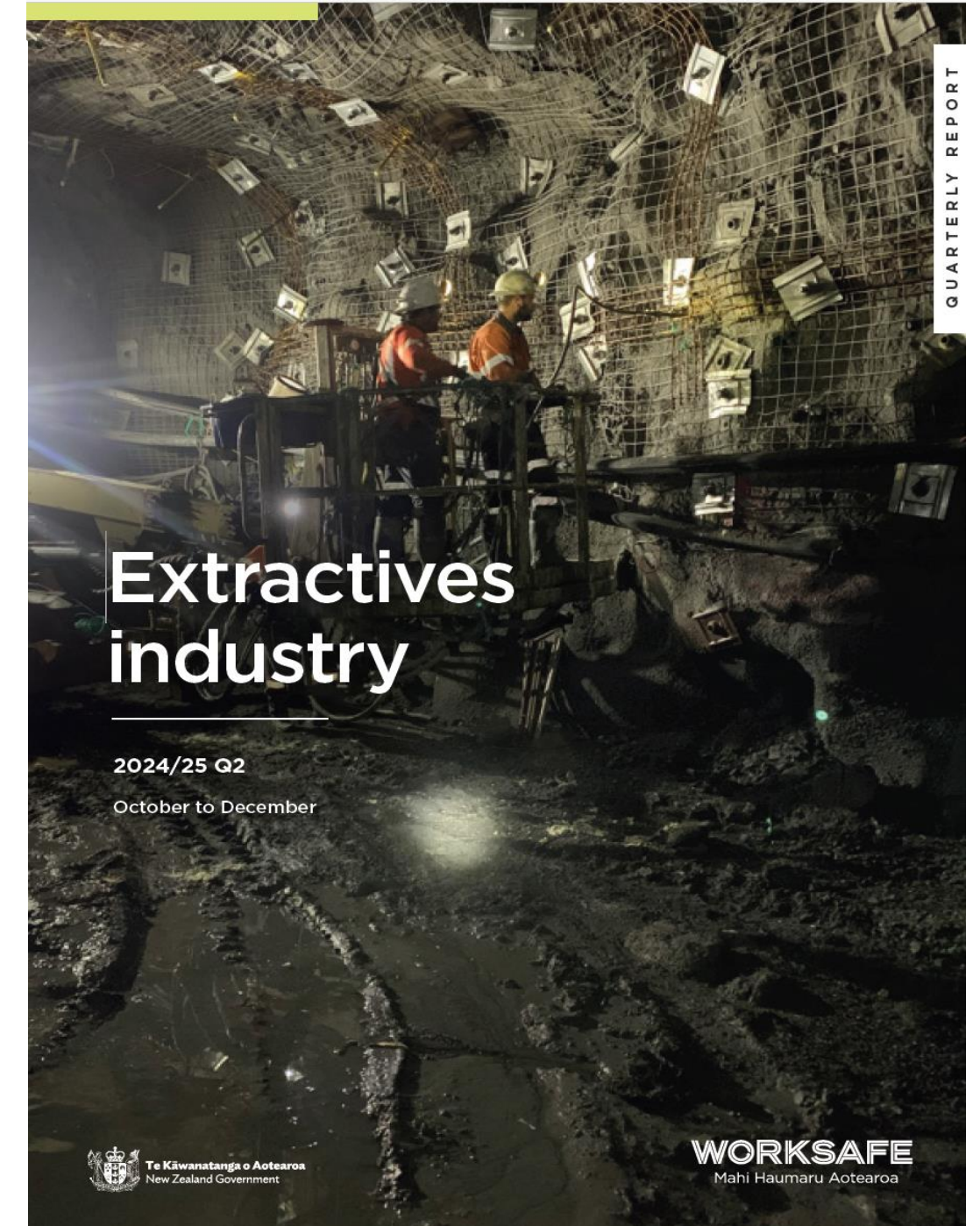
## Regulatory Expectations

The Extractive Industry Quarterly Report 2024/25 Q2 has established clear requirements for critical control management

## Lessons from Disasters

Pike River tragedy demonstrated the catastrophic consequences of inadequate management

*Moving from compliance to genuine resilience*



# Our Critical Risk Journey

## The Challenge: Limitations of Our Initial Approach

In late 2019 we implemented 'generic' Critical Control Verifications linked to Principal Hazards, but encountered significant operational limitations:

- **Fragmented Processes:** Procedures existed but didn't function as a cohesive system with clear accountability
- **Manual Workflows:** Paper-based tracking created inefficiencies and reduced verification quality
- **Limited Analytics:** Inability to aggregate data for meaningful patterns or emerging weaknesses



Without integration and automation, we couldn't establish the real-time visibility needed to prevent catastrophic events.



# Core Problem Statements

## How do we:

1. Ensure that we do everything practicable to understand our risk profile, and protect our workers from potentially fatal work conditions?
2. Demonstrate due diligence obligations in regard to Critical Risk as a senior leadership team?
3. Prove to Regulators and industry stakeholders that we understand our risks and have effective protection mechanisms in place (e.g. Port of Auckland)?

❑ Port of Auckland case showed serious regulatory and reputational consequences of inadequate critical risk management

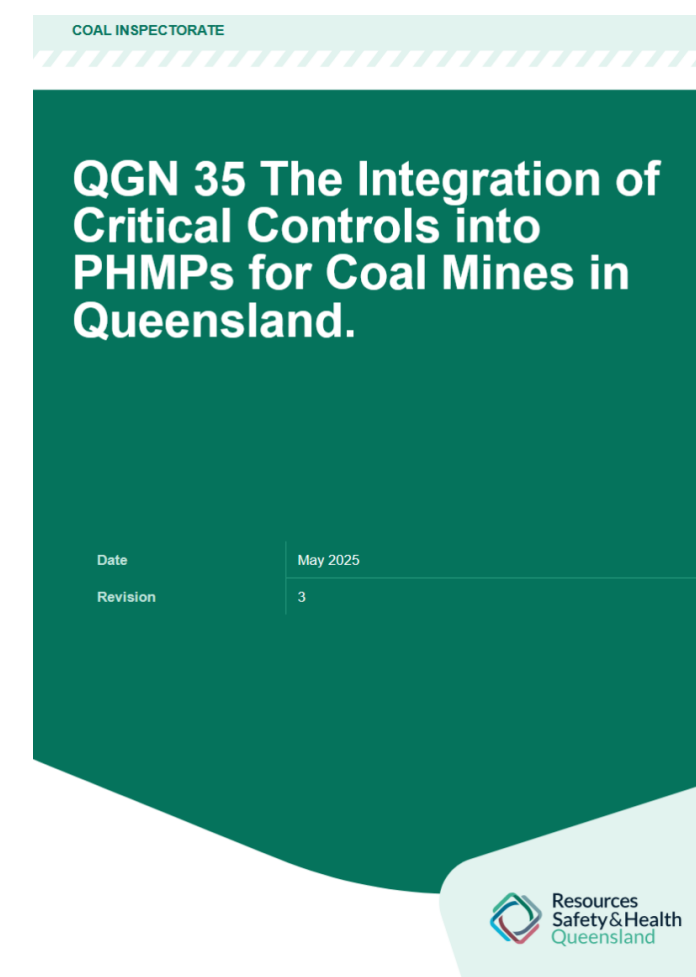


# Our Strategic Vision

- 1. Live Risk Management:** Move beyond 'set and forget' to dynamic, continuous control verification
- 2. Systematic Processes:** Create real-time visibility for monitoring and maintaining critical controls
- 3. Verification- Driven Assurance:** Implement systematic field validation to confirm controls are functioning as designed.
- 4. Proactive Control Management:** Identify and strengthen weak controls before incidents occur.



# Industry Best Practice and Guidance Material



**ICMM – Critical Control Management  
- Good Practice and Implementation Guides**  
<https://www.icmm.com/en-gb/guidance/health-safety/2015/ccm-good-practice-guide>

**Queensland Guidance Note 35 (QGN 35)  
Integration of Critical Controls into PHMPs**  
*Resources Safety and Health Queensland, May 2025*



Our approach aligns with industry-leading frameworks while being tailored to our specific operational context.



# Critical Risk Redesign Project Implementation

- **Industry Aligned Methodology:** Following ICMC and RSHQ guidance to ensure our approach meets global best practices for critical control management
- **Framework Development:** Created a comprehensive Critical Risk Management System Framework and Criticality Matrix to standardise our approach
- **Leadership Capability Building:** All Senior Managers, Risk Owners and Risk Control Owners completed specialised *Risk and Critical Control Management training through MISHC at University of Qld*
- **Systematic Analysis:** Bowtie Analysis development for all critical Unwanted Events to identify causation pathways and control points
- **Site Specific Implementation:** Identified and documented site-specific Critical Controls with clear Performance Criteria to enable effective verification



# Critical Risk Framework

BRL-HST-STD-001.04b	<i>Bathurst Resources Limited</i> Risk Matrix Tool (Critical Risk Identified)	
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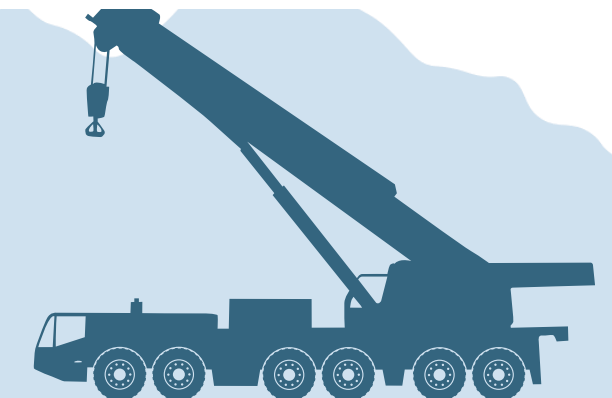
## Consequence Criteria

RATING	Primary Consideration				Secondary Consideration Note: will have been triggered by Health & Safety or Environmental considerations first		
	Financial Impact (\$)	Health & Safety	Environment	Community / Reputation	Legal & Compliance	Management Impact	
CRITICAL RISK	1	>\$20M loss or gain	Multiple fatalities; or Significant irreversible effects to 10's of people	An incident that has caused disastrous environmental impact with long term effect requiring major remediation	Prominent negative international media coverage over several days Significant negative impact on share price for months	Major litigation or prosecution with damages of \$10M+ significant costs Custodial sentence for company executive Prolonged closure of operations by authorities	Critical event or disaster with significant impact on a business unit that requires considerable senior executive time to handle over several months Full implementation of a business unit crisis management plan
	2	\$5M - \$20M loss or gain	Single fatality; and/or Permanent disability to one or more persons	An incident that has caused serious environmental impact with medium term effect requiring significant remediation	National media coverage over several days Significant negative impact on share price for weeks Community / NGO legal actions Impact on local economy	Major litigation costing \$5M+ Investigation by regulatory body resulting in long term interruption to operations Possibility of custodial sentence	Major event that requires the implementation of crisis contingency plans at a site level
	3	\$1M - \$5M loss or gain	Extensive injuries or temporary impairment to one or more persons Lost time	An incident that has caused moderate reversible environment impact with short term effect requiring moderate remediation	Local media coverage over several days Negative impact on local economy Persistent community complaints	Major breach of regulation with punitive fine Significant litigation involving many weeks of senior management time	Significant event that can be managed with careful attention – will take some site-level management time over several days
	4	\$100k - \$1M loss or gain	Medical treatment	An incident that has caused minor reversible environmental impact requiring minor remediation	Local media coverage Complaint to site and/or regulator	Breach of regulation with investigation or report to authority with and moderate fine possible	Local operation of contingency plan Will require some local management attention over several days
	5	<\$100K loss or gain	First aid treatment	An incident that has caused negligible reversible environmental impact requiring very minor or no remediation	No media coverage No community complaints	Minor legal issues, non-compliances and breaches of regulation where the effects are contained on site	No real action outside reporting and local investigation required

## Bathurst Resources Limited

### Critical Risk Management Procedure

BRL-HST-STD-001.32 v1.0

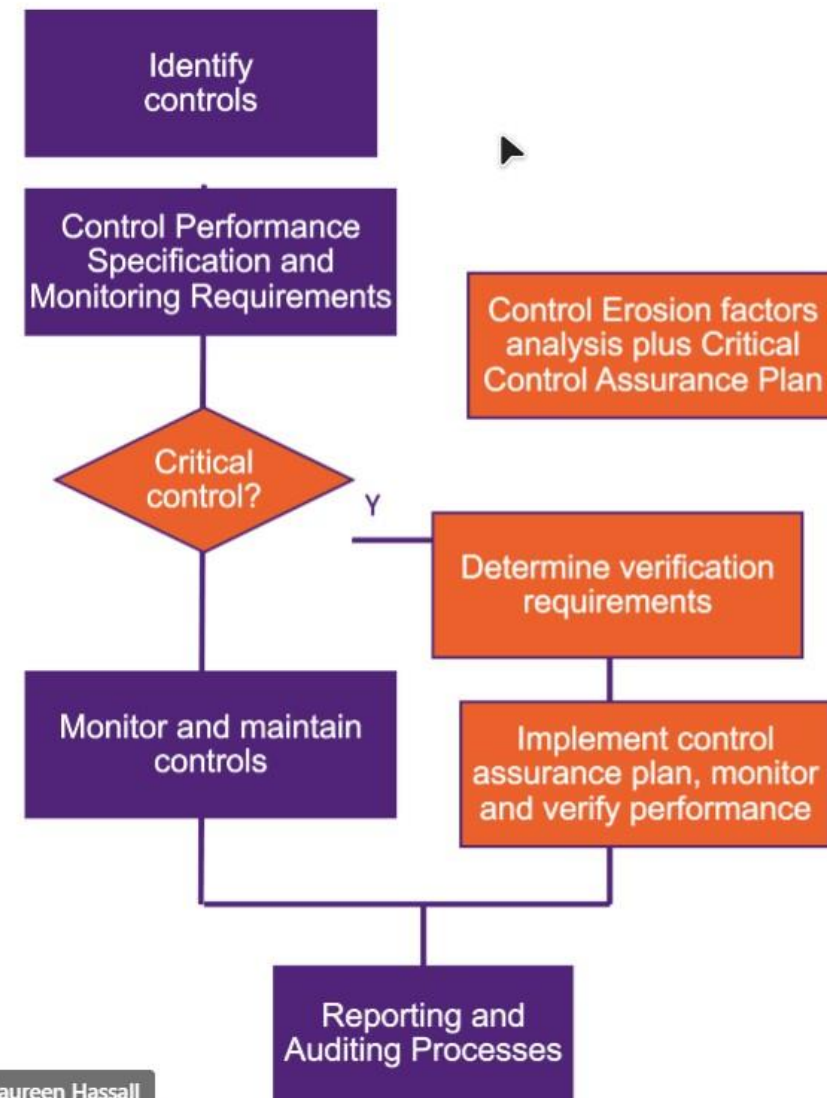


# Critical Risk Training and Awareness

## Risk & Critical Control Management Course

Developed by the Minerals Industry Safety and Health Centre (MISHC)  
Sustainable Minerals Institute, The University of Queensland

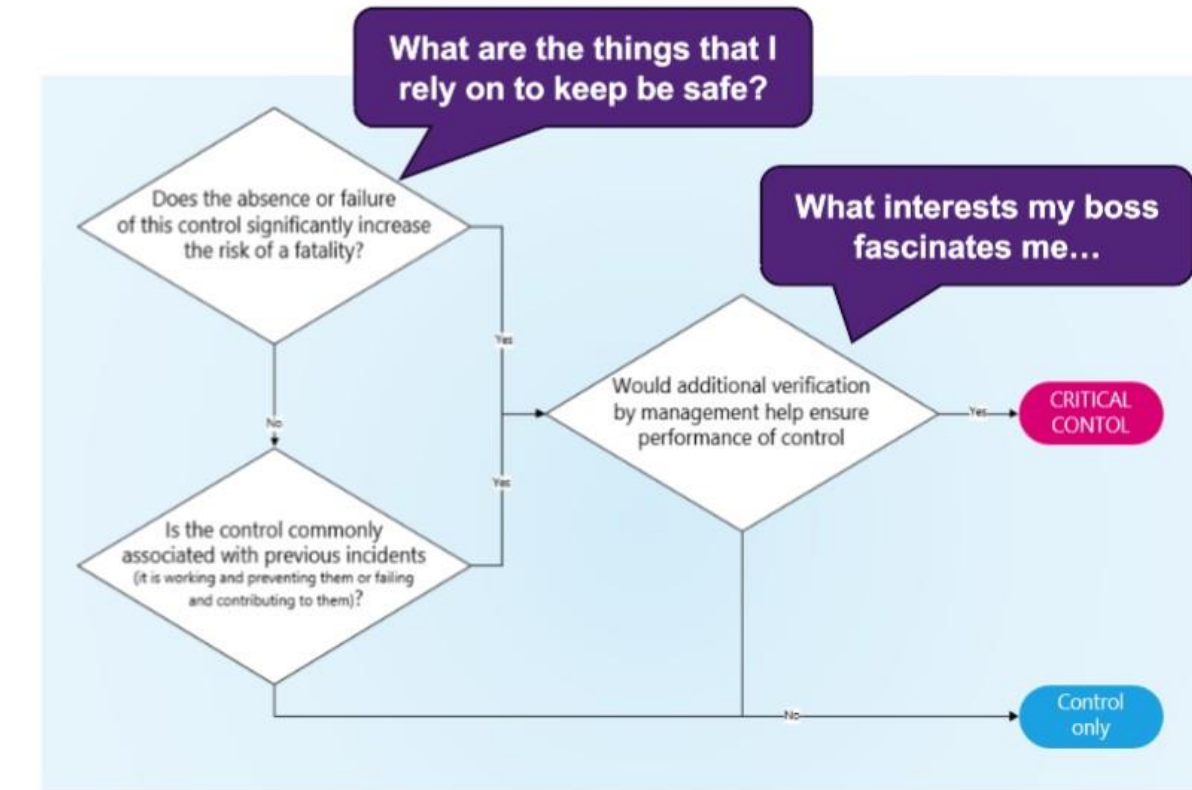
### Control vs critical control?



Maureen Hassall  
Risk 2025, Bathurst

### Critical controls

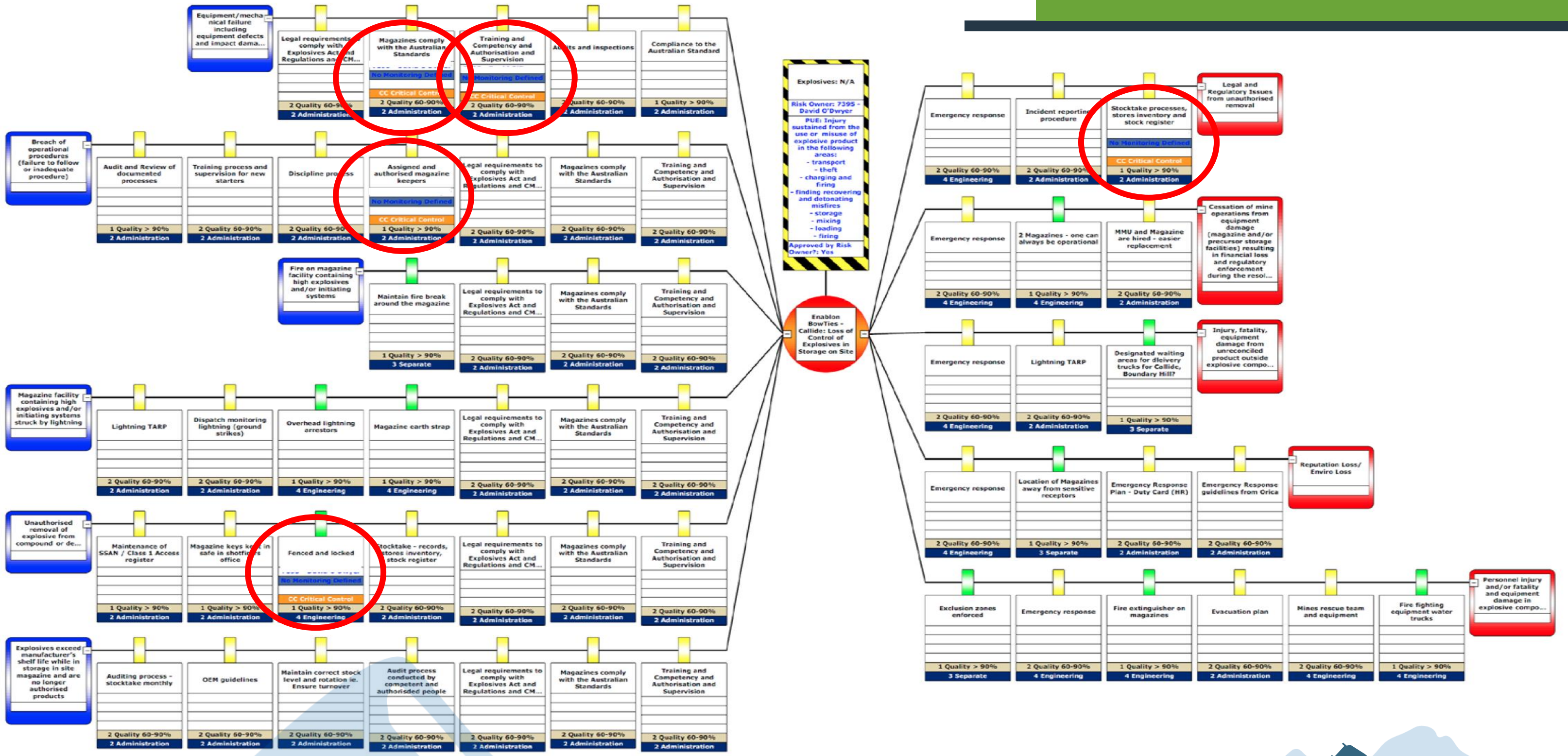
- have more detailed erosion-factors analysis to determine robust set of specification and verification requirements
- undergo double checks with frontline monitoring and an additional managerial verification



©MISHC Sourced from Hassall & Harris (2017). Risk Controls Knowledge: Determining leading practice from case study analysis. ACARP report no C25036. Available at [www.acarp.com.au/reports.aspx](http://www.acarp.com.au/reports.aspx)



# Example BowTie Diagram



# Barriers to Implementation

Bathurst acknowledges what many organisations face: Whilst system development is essential, execution will be everything.

Enduring programs depend on leadership behaviours and frontline engagement.

How do you balance leadership, workforce input, and pragmatism when embedding safety initiatives?

- Leadership Buy-in and Sustainability – *tie the outcomes to business outcomes and leadership routines*
- Progress over Perfection – *When rolling out a large program, understand the reality of competing pressures. Pilot, adapt and cheer the wins.*
- End-User Engagement – *Don't fall for the trap of prioritising process over genuine engagement*



# Next Steps

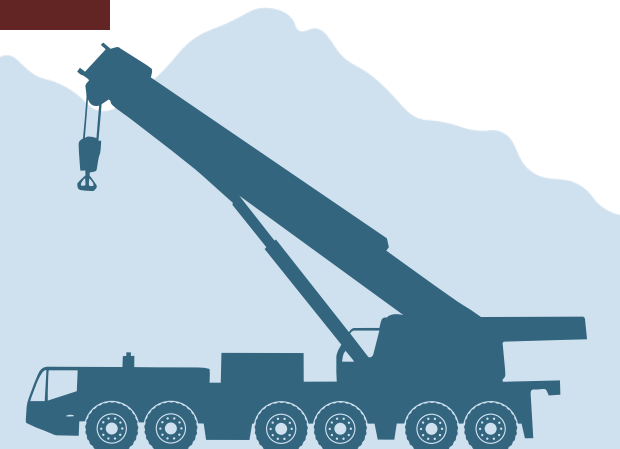
- ✓ Leveraging digital platforms for real-time verification of data (potential use of AI for predictive control effectiveness)
- ✓ Embedding verification routines
- ✓ Establishing management review cycles



## Understand your Why

- Traditional safety systems are **reactive** (primarily only take action after incidents)
- High-risk hazards demand a **resilience mindset**
- **Senior leaders should become very interested in not how the organisations could fail to prevent an event, but how the organisation could fail to control the event**

*“Safety is not about the absence of accidents, safety is about the presence of defences” (Sydney Decker)*



# Questions?

*“We’re shifting from reacting to incidents, to building resilience through a Critical Risk Management System.”*



## References:

- Health and Safety Critical Control Management – Good Practice Guide and Implementation Guidance, *International Council of Mining & Metals, (2015)* – accessed at <https://www.icmm.com/en-gb/guidance/health-safety/2015/ccm-good-practice-guide>
- Queensland Guidance Note 35 (QGN 35) The Integration of Critical Controls into PHMPs for Coal Mines in Queensland, *Resources Safety and Health Queensland, May 2025*
- Selection and Optimisation of Risk Controls – *ACARP Project C23007 - Hassall, M, Joy, J, Doran, C and Punch, M (2015)*
- AS/NZS ISO 31000:20019 Risk Management – Principles and Guidelines
- Extractive Industry Quarterly Report 2024/25 Q2 (Oct – Dec)– *WorkSafe NZ*



# About the Presenter

*Karen Belousoff is the Group Manager for Health, Safety and Training at Bathurst Resources.*

*Over the course of the last 25 years, Karen has worked in senior management roles in Open Cast and Underground Coal Mines, Port Operations and Civil Construction within New Zealand and Australia. She holds an Open Cast Coal Mine SSE CoC for both New Zealand and Queensland, along with a Bachelor of Occupational Health and Safety and a Graduate Certificate in Responsible Resource Management, majoring in Risk Management. Karen specialises in Occupational Safety and Health, Training and Risk Management Systems development, maintenance and assurance.*

*Whilst her career began in Queensland, a move into the New Zealand Extractives industry 12 years ago connected her to the New Zealand's mining community. Since then, she has played a key role in developing, implementing and auditing health and safety frameworks, aligning health and safety management systems with legislation and good practice, and delivering CoC training programs in line with recommendations from the Pike River Royal Commission. She continues to aim to influence how we approach worker safety in high-risk environments using tools such as critical risk management systems, worker competency standards, and mentoring the next generation of industry leaders.*

