

A simple step-by-step approach to identifying and managing critical controls



Purpose

The intent of critical controls is to prevent low-likelihood, high consequence events that would have catastrophic impacts on workers.

From 1 June 2026, critical control management becomes a mandatory and enforceable requirement for all mineral mines and quarries in Queensland. The intent of the legislative changes is to ensure that hazard and risk controls that matter most are clearly identified, effectively implemented, and routinely verified to be working as intended.

Step 1 – Define and document the Materially Unwanted Event (MUE) threshold

- The mine operator must define and document the threshold for unwanted events that warrant the highest level of attention so the SSE can determine MUEs.¹
- The threshold must be clearly communicated to the Site Senior Executive (SSE).
- For critical control management the threshold is typically set, as a minimum, at a multiple-fatality event.
- The MUE threshold should be deliberate, defensible and matched to the organisation's capacity to manage critical controls effectively.
- Some operators may choose to set the threshold at a single fatality event. This is permissible; however, it will increase the number of MUEs, critical controls and verification activities required.

Step 2 – Identify events that could reach the MUE threshold

- Using the defined MUE threshold, the SSE must identify events that could reasonably occur at the site and could reach that threshold.
- Identification should consider site-specific hazards, historical incidents, high potential incidents and foreseeable low-probability events.
- Other criteria to consider when defining events that may reach the MUE threshold may include:
 - reasonably foreseeable standalone fatality events that may occur at the site
 - known fatality events that have occurred at the site or at similar operations
 - relevant and reasonably available information, data, and practices from mining operations and other industries.²
- The outcome is a documented, site-specific list of MUEs.

¹ Mining and Quarrying Safety and Health Act 1999 Schedule 2 Dictionary "Material Unwanted Event"

² Mining and quarrying Safety and Health Regulations 2017 Section 7(2)(e)

Step 3 – Conduct a risk assessment for each MUE³

- The SSE must undertake or review risk assessment(s) for each identified MUE.
- The risk assessment must describe the hazard and unwanted event.
- Credible causes and consequences must be identified.
- Controls that prevent the event or mitigate its consequences must be identified.

Step 4 – Identify critical controls⁴

- Controls must be assessed to determine which ones are critical controls.
- A critical control is one that is crucial to preventing the MUE or mitigating its consequences.
- The failure or absence of a critical control would significantly increase the risk of the MUE occurring.
- The focus must be on identifying the critical few, not the important many.

Step 5 – Define performance requirements for critical controls

- Each critical control should have a clearly defined purpose.
- Performance requirements should be clearly defined.
- Performance requirements should be specific, observable and measurable.
- It should be clear what acceptable and unacceptable performance looks like.

Step 6 – Establish verification requirements⁵

- Each critical control must have a defined method for verification.
- The frequency of verification must be defined.
- Responsibility for verification should be assigned.
- Verification must confirm the control is performing as intended in the field.
- Process safety critical controls may require warnings/alarms/automatic shutdowns when parameters are outside performance requirements.

Step 7 – Document critical controls in a central register

- Critical controls must be documented in the safety and health management system (SHMS)⁶.
- A register in the SHMS should include the MUE, the critical control, performance requirements, verification requirements, responsible roles and current status.
- The register should be maintained and used as an operational and governance tool.

Step 8 – Act when a critical control is defective⁷

- If monitoring or verification identifies that a critical control is not performing as required, action must be taken.
- Defective critical controls must be addressed promptly.
- Work may need to be modified or stopped until the critical control is restored.
- The absence of incidents must not be relied upon as evidence that controls are effective.

³ Mining and Quarrying Safety and Health Regulation 2017 Part 2 Safety and Health Risk Management

⁴ Mining and Quarrying Safety and Health Act 1999 Schedule 2 Dictionary “Critical Control”

⁵ Mining and Quarrying Safety and Health Act 1999 S.27 Risk Management

⁶ Mining and Quarrying Safety and Health Act 1999 S.55(5)(e) Safety and health management system

⁷ Mining and Quarrying Safety and Health Act 1999 S.55(5)(f) Safety and health management system

Step 9 – Report critical control performance to the mine operator⁸

- The SSE should routinely report to the mine operator on critical control performance.
- Reports should include verification outcomes and actions taken to address deficiencies.
- Reporting enables the operator to exercise effective oversight of material risks.

Step 10 – Ensure adequate resourcing⁹

- The mine operator must ensure the SSE has sufficient resources to manage critical controls effectively.
- This includes access to competent people, safe plant and equipment, support and time to carry out work safely.
- Critical control management must be resourced to ensure risks are as low as reasonably achievable.

Step 11 – Inform and train workers¹⁰

- Workers must be informed about relevant MUEs and critical controls.
- Workers must understand why the critical controls matter.
- Workers must understand what to do if a critical control is not working as intended.
- Workers must understand and demonstrate the required actions to be taken in responses to warnings, alarms and when critical controls are found to be ineffective.

⁸ Mining and Quarrying Safety and Health Act 1999 S.38(1)(f) Obligations of operators

⁹ Mining and Quarrying Safety and Health Act 1999 S.38(1)(g) Obligations of operators

¹⁰ Mining and Quarrying Safety and Health Regulations 2017 S.93 Training