



Mine Safety and Health Management Course: Principal Hazards, Critical Controls and Mine Rescue



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Introduction:

Mine safety and health management covering principal hazards, critical controls and mine rescue is a 5-day course for mine operations, HSE, shift supervision and emergency response teams at open-pit and underground mines, ending with a Principal Hazard and Critical Control Plan for a case mine. Fatal mining events recur when ground falls, vehicle collisions, fires, blasting misfires and silica exposure are managed through generic procedures rather than verified critical controls. Nominees already supervise or assure mining work and test controls against incident files, inspection records and rescue drills in case study exercises. CoreConcept Training Center delivers this mine safety course.

Course Objectives:

- Identify the principal mining hazards of an open-pit or underground operation and rank them as material unwanted events
- Prepare principal hazard management plans for ground failure, vehicle interaction, mine fire, explosives and respirable dust
- Apply bowtie analysis and ICMM critical control management to select critical controls, set performance requirements and assign control owners
- Set fatigue, haul-road and pit-edge controls for mobile plant and verify them through field checks
- Organise mine emergency response, refuge and self-rescuer provisions and mine rescue team readiness
- Audit mine safety performance with critical control verification rates and leading indicators, and compile a Principal Hazard and Critical Control Plan

Target Audience:

- Mine operations managers accountable for safe production in open pits or underground workings
 - Mine HSE leads responsible for hazard registers, risk assessments and safety assurance on site
 - Shift supervisors and superintendents who direct crews, mobile plant and blasting activity at the face or bench
 - Emergency response and mine rescue coordinators responsible for drills, rescue equipment and brigade readiness
 - Occupational health staff who monitor dust, silica, noise and fatigue exposure among mine workers
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Course Outline:

Day 1: Mining Fatality Patterns, Principal Hazards and Site Baseline

- Mining Fatal Incident Patterns by Energy Source
- Principal Mining Hazard Register for Pits and Underground Workings
- Material Unwanted Event Screening Using Consequence Severity
- Hierarchy of Controls Applied to Mining Energy Sources
- Mine Safety Baseline Review Using Site Hazard Checklist

Day 2: Bowtie Analysis and Critical Control Management Framework

- Bowtie Diagram Threats, Top Event and Consequence Mapping
- Preventive and Mitigating Barrier Identification on Bowties
- ICM Critical Control Selection Criteria and Screening
- Critical Control Performance Requirements and Control Owner Roles
- Risk Assessment Matrix Linked to Principal Hazard Plans

Day 3: Principal Hazard Management Plans for Ground, Fire, Explosives and Dust

- Ground Failure Hazard Plan With Pit Wall and Backfall Triggers
- Mine Fire Hazard Plan for Mobile Plant and Conveyors
- Explosives Handling, Misfire and Flyrock Exclusion Zone Controls
- Respirable Crystalline Silica Exposure Monitoring and Dust Suppression
- Noise and Heat Stress Exposure Controls for Mine Crews

Day 4: Vehicle Interaction, Fatigue, Emergency Preparedness and Mine Rescue

- Vehicle Interaction Controls With Segregation and Proximity Detection
- Haul Road Berm, Intersection and Pit Edge Safety Inspection
- Fatigue Risk Management Using Roster Analysis and Alertness Checks
- Mine Emergency Response Plan With Refuge and Self-Rescuer Provisions
- Mine Rescue Team Organisation, Breathing Apparatus and Drill Evaluation

Day 5: Case Study Build of the Principal Hazard and Critical Control Plan

- Case Mine Incident File and Hazard Register Review
 - Case Bowtie Construction for a Selected Material Unwanted Event
 - Case Critical Control Verification Checklist and Field Audit Plan
 - Mine Safety Leading Indicators and Verification Rate Dashboard
 - Principal Hazard and Critical Control Plan Completion
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Skills You Will Gain:

- Principal Hazard Identification
- Bowtie Barrier Analysis
- Critical Control Verification
- Ground Failure Risk Control
- Respirable Dust Exposure Control
- Vehicle Interaction Management
- Mine Emergency Planning
- Mine Rescue Readiness Review

Why Attend This Course:

- Deliver a Principal Hazard and Critical Control Plan for a case mine to the mine manager and the site HSE lead for approval
- Decide which controls on each principal hazard are critical, who owns them and how often field verification must occur
- Prevent fatal ground falls, vehicle collisions and fire or blasting events that follow from unverified or degraded controls
- Brief supervisors and control owners using the bowtie templates, verification checklists and emergency drill scoring sheets

Conclusion:

Back at work, the participant presents the Principal Hazard and Critical Control Plan to the mine manager, the site HSE lead and the emergency response coordinator. They use it to approve the critical control list, control owner assignments, field verification frequencies and rescue readiness actions for each principal hazard. After the first quarter of field verification under the plan, the unit should review control failure findings, overdue verifications, near-miss reports linked to principal hazards and the outcome of the latest emergency drill.

Frequently Asked Questions FAQ:

What should participants know before the mine safety and health management course?

Participants should already supervise, manage or assure work at an open-pit or underground mine and read hazard registers or incident reports. Bringing an anonymised hazard register, bowtie or emergency plan from their own site helps them apply the case study exercises.

How does the mine safety and health management course differ from a general occupational safety management system course?

It concentrates on the fatal-risk hazards specific to mining, such as ground failure, mobile plant interaction, mine fire, blasting and silica dust, and on critical controls and mine rescue. General safety system courses cover policy, documentation, audit cycles and management review across all industries.

Why does mine safety and health management rely on critical controls rather than long control lists?

A small set of controls prevents or limits each fatal event. Naming those controls, setting performance requirements, giving each an owner and verifying them in the field shows managers whether protection against a principal hazard is actually working, instead of assuming many procedures cover it.

What does a participant take back from the mine safety and health management course?

Each participant returns with a Principal Hazard and Critical Control Plan for a case mine, plus bowtie templates, a critical control verification checklist, an emergency drill scoring sheet and a leading indicator dashboard adaptable to their own operation.
