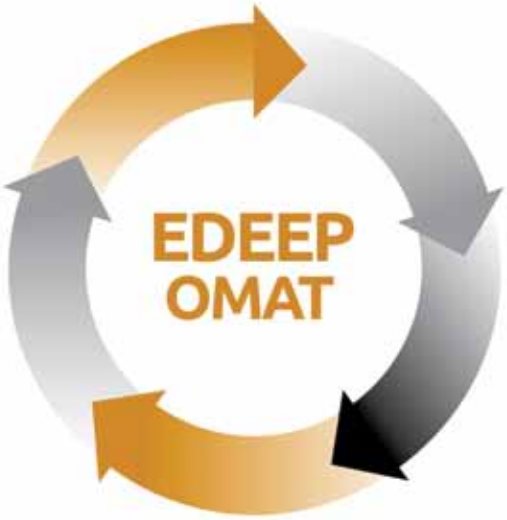
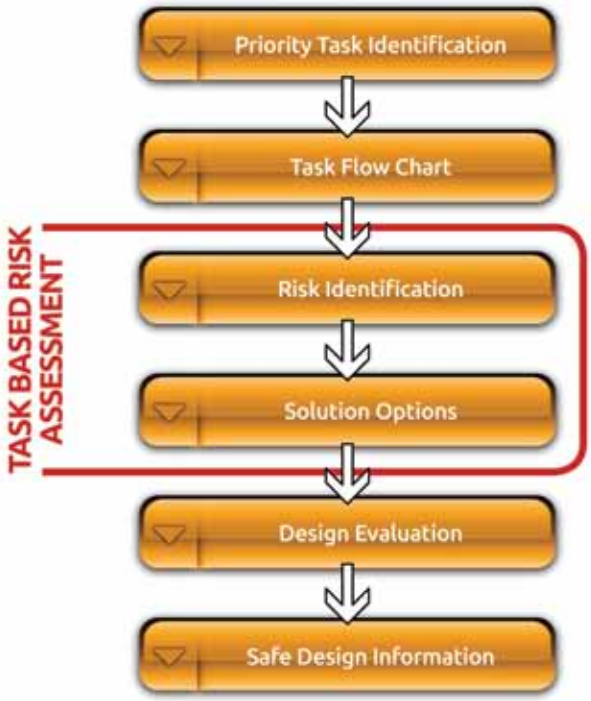
SECTION 3

Procurement Document Forms





AN INTRODUCTION TO EDEEP EXCEL DOCUMENT:

EDEEP – EMESRT Design Evaluation for Equipment Procurement - is designed as a way for OEMs to generate and document information for provision to prospective equipment purchasers which describes the design features of the equipment which reduce the risks associated with operation and maintenance of the equipment. The EDEEP documentation is comprised of several sections including a final 'Safe Design Information' document which is to be supplied to prospective purchasers for evaluation.

PTI (Priority Task Identification) information:

The PTI form is for OEM use only. The aim of the form is to assist the identification of priority tasks for subsequent detailed risk assessment. All operation and maintenance tasks associated with the equipment are examined to determine whether any of 20 potential unwanted events derived from the EMESRT Design Philosophies may occur during the performance of the task. If so, the maximum reasonable consequence which may arise from each relevant potential unwanted event is assessed. Combining this information with the frequency with which the task is performed provides a means of prioritising the operation and maintenance tasks for further attention.

DP Reference Information:

Each of the 20 Potential Unwanted Events utilised within the Priority Task Identification template is associated with one or more references to the EMESRT Design Philosophies. Hyperlinks within the PTI template link the unwanted events to associated DP references and, in turn, to the 8 EMESRT Design Philosophies.

The 8 EMESRT design philosophies:

The 8 EMESRT DPs provide detailed descriptions of detailed potential unwanted events related to a specific DP.

The 8 EMESRT Design Philosophies comprise:

1. A&W@H (Access and Working at Heights)
2. Tires
3. ExpHE (Exposure to Harmful Energies)
4. Fire
5. MOC (Machine Operation and Controls)
6. HIF (Health Impacting Factors)
7. ManTasks (Manual Tasks)
8. CSRWA (Confined Spaces and Restricted Work areas)

Operability and Maintainability (OMAT) information:

The OMAT template provides a means of documenting the outcomes of a task-based risk assessment conducted using the Operability and Maintainability Analysis Technique described in detail in the OMAT manual. The risk assessment is required to be undertaken with the involvement of mining company-based operation and maintenance personnel. This information is for OEM use only.

Safe Design Information:

The Safe Design Information template provides a common format for the supply of information drawn from the outcomes of a task-based risk assessment (such as OMAT) to prospective purchasers. For each priority task and relevant Potential Unwanted Event, the design features which control the risks are listed along with a rationale and evaluation of the effectiveness of these features. In many cases this will require making reference to additional reports which are to be supplied with the completed Safe Design Information template.

Document Control Information

Information identifying the equipment to which the information relates and other document control information (eg., author, revision history) should be entered here. It is also critical that information be entered regarding the positions and experience of the participants in task-based risk assessments from which the Safe Design information is drawn (whether OMAT or other technique is utilised).

PRIORITY TASK IDENTIFICATION (for OEM records only)

Task Frequency
1. Annually
2. Quarterly
3. Monthly
4. Weekly
5. Shiftly
6. Many times per shift

Maximum Reasonable Consequence
1. Minor - No treatment or first aid only
2. Medium - Medical treatment, no lost time
3. Serious - Lost time injury
4. Severe - Single fatality or severe irreversible injury / illness
5. Catastrophic - Multiple fatalities or severe irreversible injuries

Equipment details **Worked Example - Underground Coal Integrated Bolter Miner**

Task Description	Task Type	Task Frequency	Consequence Input																			
			Potential Unwanted Events																			Total inherent risk score
			1 Fall from height	2 Fall on same level	3 Egress blocked during emergency	4 Struck by/ contact with materials, substances or moving objects	5 Caught between moving objects	6 Wheel assembly, rim or tire failure, explosion	7 Fire	8 Exposure to hazardous manual tasks	9 Collisions	10 Loss of machine stability	11 Inadvertent or erroneous operation of a controls	12 Incorrect understanding of display or label	13 Failure to respond to an alarm	14 Extreme temperature exposure	15 Respirable dust exposure	16 Exposure to DPMs or other particulates	17 Harm due to noise exposure	18 Whole-body or peripheral vibration exposure	19 Failure of control system	20 Exposure to irrespirable atmosphere in confined space	
Access platform	Oper	6		3																		150
Roof Bolting	Oper	6	2	2		3	3			3			4		1				3				1116
Rib Bolting	Oper	3		2		3	3			3			4						3				540
Cutting & loading	Oper	6		2													4		3				630
Break away	Oper	4		2																			20
Tramming	Oper	4		3							4		4		1								704
Pre-start inspection	Main	5		2																			25
Changing picks	Main	4		2		4				3													420
Filling oil	Main	5		3						3													250
Monthly inspections	Main	3		2																			15

OMAT TASK-BASED RISK ASSESSMENT (for OEM records only)

Assessment reference number: Worked Example - Integrated Bolter Miner

Task No: 2

Name of Task: Roof Bolting	**Date:**
Task Process Map Reference:	**Location:**
Team:	**Facilitator:**

Task Step ID #	Potential Unwanted Event	Relevant DP	Event Likelihood	Maximum Reasonable Consequence	Risk Ranking	Current Design Controls	Control Evaluation	Suggested New Design Controls	Suggested Administrative Controls
1 - retrieve bolting materials	Hazardous Manual Tasks	Manual Tasks	Almost Certain	Minor	Moderate	Provision of storage pod allowing bolts and plates and other supplies to be accessed without requring awkward postures.	Passive engineering control which reduces exposure to awkward postures. Task still requires repeated manual handling - manual task risk evaluation required.	Would be eliminated by automated bolting.	Ensure supply pod is loaded onto CM via LHD.
2 - walk along platform	Fall on same level	Access	Possible	Medium	Moderate	Platform is single level and sufficiently wide to allow miners wearing self-rescuer and battery to walk without turning sideways. Storage locations are provided for dril steels, chemicals, plates etc which do not impinge on the walkway and reduce the risk of tripping hazards. Platform handrails are provided.	Passive engineering control which reduces risk of tripping. Assess via general arrangement drawing with respect to large male with rescuer & battery.	Platform lighting would reduce the risk further, requires careful placement to ensure no glare in operator's eyes. Lighting survey required.	Ensure good house keeping.
3, 6, 7 - handle drill steel and bolts	Hazardous Manual Tasks	Manual Tasks	Almost Certain	Serious	Critical	Drill rigs are oriented to place drill head close to platform. Platform space adjacent to bolting rigs is ample to allow miner wearing self-rescuer and battery to get as close as possible to drill head, reducing reach distance to 0.5m.	Passive engineering control which reduces reach distances, and thus shoulder load during these tasks steps. The task still requires repeated manual handling - manual tasks risk evaluation required.	Would be eliminated by automated bolting.	Consider task rotation.
4 - place mesh in position	Hazardous Manual Tasks	Manual Tasks	Almost Certain	Medium	High	A mesh carrier is provided which allows a mesh to be loaded via LHD and brought forward to the bolting rigs without manual handling. A step is provided to allow bolters to reach roof mesh.	The engineering control allows bolters the option of reducing the awkward posture required to reach roof mesh, however it creates a slip/trip hazard. manual tasks risk evaluation required.	Provision of a height adjustable platform would allow the reach distance to be minimised regardless of cutting height. Would be eliminated by automated bolting (and automated mesh placement) or use of a spray on polymer to provide skin protection.	Consider task rotation.
5, 8, 9, 10 - operate bolting controls	Struck by materials / Caught between moving objects	Machine operation and controls	Possible	Major	Critical	Two handed control operation is required for fast feed operations. Hydraulic hosing in the operator workstation is behind covers or otherwise protected.	Engineering control prevents the operator from having a hand in a hazardous zone during fast-feed operations. Operator is isolated from hydraulic fluid as far as possible. Audit with respect to MDG35.1 & MDG41.	Would be eliminated by automated bolting.	Training and supervision to ensure two-handed control is not defeated.
5, 8, 9, 10 - operate bolting controls	Inadvertant or erroneous control operation	Machine operation and controls	Likely	Major	Critical	Guarding is provided to prevent inadvertent operation from falling materials. Controls are shape coded and in consistent loactions to reduce selection errors. Directional control-response relationships are compatible.	Engineering control will reduce but not eliminate probability of unwanted event. Shape coded controls could be swapped during maintenance. Requires ergonomist to assess HMI.	Ensure different shape handles cannot be swapped during maintenance. Would be eliminated by automated bolting.	Training and objective assessment of operator competency.
5, 8, 9, 10 - operate bolting controls	Hazardous manual tasks	Manual Tasks	Possible	Minor	Low	Control layout and design allows operation without exposure to awkward postures or forceful exertions.	Passive engineering control which reduces manual tasks risks ALARP. MDG35.1 requires assessment of reach distances etc.	Would be eliminated by automated bolting.	

EMESRT DESIGN PHILOSOPHY (DP) PROMPTS

PLEASE NOTE: These examples are provided for guidance only. Complete forms and source DPs with full detail and all linkages can be viewed and completed electronically on the flash drive.

EMESRT Design Philosophy (DP) Potential Unwanted Events									
1	2	3	4	5	6	7	8	9	10
Fall from height	Fall on same level	Egress blocked during emergency	Struck by/contact with materials, substances or moving objects	Caught between moving objects	Wheel assembly, Rim or tire failure, explosion	Fire	Exposure to hazardous manual tasks	Collisions	Loss of machine stability
1.1	1.1	1.3	1.4	2.2	2.5	4.1	5.1	5.4	5.7
1.6	7.4	4.4	1.5	3.5	2.8	4.2	7.1	5.5	
7.5		8.7	2.1	3.3	2.9	4.3	7.7	5.6	
			3.1	3.4	2.1	4.5	8.3	5.10	
			3.2	7.2	2.6	4.6	2.3		
			3.6	7.6	2.7	4.7	2.11		
			3.7	7.7					
			3.8						
			3.10						
			4.6						
			5.2						
			7.3						
			8.5						

EMESRT Design Philosophy (DP) Prompts									
11	12	13	14	15	16	17	18	19	20
Inadvertent or erroneous operation of a control	Incorrect understanding of display or label	Failure to respond to an alarm	Extreme temperature exposure	Respirable dust exposure	Exposure to DPMs or other particulates	Harm due to noise exposure	Whole-body or peripheral vibration exposure	Failure of control system	Exposure to irrespirable atmosphere in confined space
5.8	5.9	5.11	6.1	6.1	6.1	6.1	6.1	6.2	8.1
3.9			8.2	6.3	6.3	6.3	6.3		8.6
						6.4	6.6		8.4
						6.5	2.4		8.8

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DP 1. Access & Working at Heights	Potential Unwanted Events						
Detailed Potential Unwanted Events (PUEs)	Fall from height	Fall on same level	Sprain/strain injury during maintenance	Blocked access/egress	Falling materials	Striking protrusion during access/ egress	Access systems restricting visibility
1. Injury during access to equipment and its routine service and inspection points, work platforms and operator workstation due to poor location of service and inspection points, lack of fall from height protection, slippery surfaces, accumulation of dirt or other material, or poorly lit environment	1.1	1.1					
2. Sprains and strains during access to equipment due to the need to adopt ergonomically difficult body positions to negotiate the designed access point or system			1.2				
3. Harm due to entrapment or obstruction should normal access be blocked by fire (including tire heating) or machine damage				1.3			
4. Harm from materials falling off platforms on to persons below					1.4		
5. Injury caused by fasteners, brackets hoses, and fittings that protrude into the walkways and work areas						1.5	
6. Injury from falls caused by using chains as part of the handrail or ladder opening protection	1.6						
7. Injury from collisions due to restricted operator vision from the cabin due to machine access and platform structures, and/or their location							1.7

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DP 2. Tires & Rims	Potential Unwanted Events						
Detailed Potential Unwanted Events (PUEs)	Uncontrolled release of pressure	Struck by/caught between during maintenance	Sprain/strain injury during maintenance	Exposure to peripheral vibration	Assembly failure	Rim or tire failure	Pyrolysis/explosion of tire & rim assembly
1. Harm due to uncontrolled release of pressure from the tire and rim assembly during operation and maintenance due to: a. Overly complicated rim assembly systems that drive unwanted behaviours such as i. Failure to remove pressure from tires ii. Failure to follow the correct procedure or sequence when attempting to maintain or remove them b. Inter-reliance of components	2.1						
2. Crush injury during maintenance activities due to: a. Physical size of the wheels b. Need to have people working inside the arms of tire manipulators c. Impractical and inaccessible jacking points		2.2					
3. Strain and sprains during maintenance activities			2.3				
4. Chronic health implications (e.g. musculoskeletal disorders (MSDs), white finger, hearing loss) from high frequency use of maintenance tooling				2.4			
5. Harm due to abnormal rim condition that becomes evident only when the rim fastening system is released						2.5	
6. Harm due to assembly failure from mismatched components on multiple component rim assemblies					2.6		
7. Harm from pyrolysis / explosion of the tire and rim assembly due to e.g. improperly fitted tire/rim under correct inflation pressure							2.7
8. Harm due to a. wheel nuts falling off b. stud failure due to over-torque c. failure to retorque some time after fitment						2.8	
9. Harm due to tire or rim failure occurring because there is no provision for repair history or previous duty to be linked to individual tires and rims						2.9	
10. Harm due to tire operating condition becoming critical without the operator's knowledge						2.10	
11. Musculoskeletal or crush injury caused by mounting and dismounting of spare tires from storage or carriers			2.11				

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DP 3. Exposure to Harmful Energies	Potential Unwanted Events								
Detailed Potential Unwanted Events (PUEs)	Struck by /contact with hot surfaces	Struck by/contact with electrical components	Struck by/contact with compressed air	Struck by/contact with high pressure fluids	Struck by/contact with/caught between moving/ falling objects	Exposure to radiation	Residual energy in isolated systems	Unintended or erroneous activation of operational controls	Failure of components, hoses, pipes or fittings
1. Harm from exposure to energies such as heat; electricity; radiation; compressed air; high pressure fluids, including hydraulic fluids; and falling objects	3.1	3.1	3.1	3.1	3.1	3.1			
2. Friction burns, injection or other harm due to working in close proximity to hydraulic equipment or systems				3.2					
3. Entanglement in rotating parts including engine fans; pulleys; drive belts; gears; drive drums; rollers; and rotating shafts, including drill rods and steels					3.3				
4. Injury from being struck by a release of poorly secured moving or rotating equipment or components					3.4				
5. Entrapment, entanglement, and/or crushing from moving equipment such as: arms, jaws, gates, doors, pull down ropes/chains, winches and foot clamps					3.5				
6. Scalding or burning from exposure to accessible hot surfaces including but not limited to, engines, hot exhaust, engine components, cooling systems and hydraulic components	3.6			3.6					
7. Electrocution or burning from contact with electrical switches, wires or devices		3.7							
8. Harm from exposure to: a. Energy induced in hydraulic systems from cylinders. b. Energy inadvertently released by secondary systems eg fire systems, air bags. c. Residual energy retained after isolation and apparent de-energisation eg in springs, ropes, conveyor systems, accumulators, receiver tanks and fire systems d. Energy released from pressure vessels that have not been safely depressurised, including premature removal of radiator caps			3.8	3.8		3.8	3.8		
9. Harm from exposure to harmful energy due to a. unintended activation of controls b. failure to isolate and secure components with stored energy eg raised, slewed or articulated equipment						3.9	3.9	3.9	
10. Harm from exposure to high pressure fluids as a result of failure of components, hoses, pipes or fittings due to: a. Corrosion b. Excessive pressure build up c. Damage (eg from fallen material)				3.10					3.10

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DP 4. Fire	Potential Unwanted Events							
Detailed Potential Unwanted Events (PUEs)	Fire arising from damage to electrical cables, hydraulic hoses, fuel lines	Heat generated by surface frictions	Ignition of combustible materials	Fire blocking emergency egress	Isolation points located in fire hazard zones	Accidental /delayed activation of FSS	Struck by/ contact with FSS components	Uncontrolled spread of fire
1. Harm from fire arising from damage (including heating, melting and chaffing) to electrical cables and components; hydraulic hoses; and fuel lines due to design inadequacies, including a. poor location b. inadequate segregation of fuel and ignition sources c. flaws in clamping or restraints	4.1							
2. Harm from fire arising from heat generated by surface frictions (including tires)		4.2						
3. Harm from fire igniting in, or being propagated by, the build up of combustible material e.g. dirt, oily rags			4.3					
4. Harm from entrapment in the cabin due to fire blocking emergency egress				4.4				
5. Harm from entry into hazard zones due to the location of isolation points					4.5			
6. Injury to personnel, either during normal operation or in the event of a roll over or other accident, from inhalation, ingestion, skin abrasion, slips, trips or other mechanism due to: a. FSS components that are poorly located b. Accidental actuation of the FSS						4.6	4.6	
7. Harm from excessive/uncontrolled spread of fire, due to: a. Lack of automatic engine shutdown and/or isolation of fuel sources b. Inactivation of FSS due to the effects of fire and/or other damage c. Delayed activation of FSS due to difficult access to FSS controls d. Reduced effectiveness of FSS as a result of OEM fitted options, such as noise suppression blankets						4.7		4.7

DP 5. Machine Operation & Controls	Potential Unwanted Events									
Detailed Potential Unwanted Events (PUEs)	Musculoskeletal injury from manual tasks risk factors	Struck by protrusion into work space	Harm from adverse environmental conditions	Harm from whole-body vibration exposure	Collisions due to restricted visibility	Loss of machine stability	Inadvertent/ erroneous operation of controls	Incorrect understanding of displays or labels	Missed or ineffective communication	Alarms being undetected, misunderstood or ignored
1. Musculoskeletal injury or illness due to workstation design, including seat and seatbelt design, openings and cab height, that promotes biomechanically compromised postures for the 5th percentile female to 95th percentile male body dimensions including: a. Inappropriate or compromised head/neck posture due to restricted visibility and/or control and display positioning b. Inappropriate or compromised hand/wrist posture due to mechanism required to manipulate/grasp control c. Inappropriate or compromised shoulder and back posture due to extended reach to controls d. Excessive forces required to appropriately operate buttons, triggers, hand & foot controls, levers and other devices e. Inappropriate or compromised posture due to lack of adjustability of seat, pedals, steering wheel/controls, monitors/displays f. Postures arising from poor seat and belt design, resulting in improper operator utilization e.g. i. Inadequate lumbar support and adjustability ii. Inadequate reduction of exposure to whole-body vibration	5.1			5.1						
2. Injury due to workstation design & external structures, including: a. Protruding structures b. Sharp edges c. Structures not adequately fixed to equipment d. Roll over protection structures (ROPS) e. Intrusion into the cab by other equipment, such as the tray of another haul truck		5.2								
3. Injury or illness from physical and/or mental fatigue due to: a. Inadequate control of environmental conditions in the cab e.g. heat, cold, dust b. Inadequate illumination of cab and displays c. Glare from reflective sources d. Whole-body and hand/arm vibration			5.3	5.3						
4. Harm from impaired visibility (including distorted or degraded vision) or impaired awareness of hazards in a variety of operating conditions due to: a. inadequate lighting for headlights, tail, reversing, turn, brake, strobe, flashing lights, etc b. inadequately lit inspection areas c. lack of fit for purpose receptacles for light fittings that suit standard & alternative lights d. devices (mirrors, cameras, windscreen wipers and washers etc) that are not fit for purpose.					5.4					
CONTINUED OVERLEAF...										

DP 5. Machine Operation & Controls	Potential Unwanted Events									
Detailed Potential Unwanted Events (PUEs)	Musculoskeletal injury from manual tasks risk factors	Struck by protrusion into work space	Harm from adverse environmental conditions	Harm from whole-body vibration exposure	Collisions due to restricted visibility	Loss of machine stability	Inadvertent/ erroneous operation of controls	Incorrect understanding of displays or labels	Missed or ineffective communication	Alarms being undetected, misunderstood or ignored
5. Harm from restricted or impeded operator vision of the surrounding environment and for tool operation, due to: a. Cab layout, location of windows and external structures (catwalks, handrails, protective structures, line of site mirrors, etc.) b. Poorly located or designed internal attachments, such as screens, hardware, equipment displays, sun blinds, etc					5.5					
6. Harm from collisions due to persons and small vehicles being encouraged/forced, by the equipment design, to locate on the operator's blind side.					5.6					
7. Harm from loss of machine stability while operating, tramming, articulating or relocating due to: a. Inappropriate gear selection or over speed conditions on a grade b. Working outside limits of lifting capacity and operating radius c. Incorrect load placement or overloading, which may cause loss of steering control d. Failure of stability devices (eg. outriggers) e. Failure to warn operator when design limits are being exceeded.						5.7				
8. Harm from incorrect use of equipment controls, incorrect/inaccurate calibration or ineffective maintenance due to poorly designed controls and displays, including: a. lack of understanding or misunderstanding about function of the control or display b. counter-intuitive design and configuration c. inconsistency in display or function in comparison with other controls or displays (within vehicle) d. not appropriately considering simultaneous control operation e. ability for unintentional operation or selection f. unexpected operating mode (mode errors) g. frequently used and/or safety critical controls not being located within the zone of reach h. insufficient clearance around controls and other workstation equipment							5.8			
9. Harm from misinterpretation of information due to displays or labels being: a. Illegible b. Incomprehensible c. Not visible d. Inappropriately located e. Not using universal symbols or standardized terminology f. Not durable								5.9		
10. Harm due to difficult access to communication systems, such as no two-way radio provision in cabin									5.10	
11. Harm, including mental overload, from warnings and alarms being overlooked, ignored or not heard due to these: a. Not being seen/heard or understood b. Not being reliable or sufficiently sensitive c. Being over sensitive d. Not fully integrated or interlocked with other warning systems e. Being over-used, tampered with or compromised in any way e.g. being turned off										5.11

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DP 6. Health Impacting Factors	Potential Unwanted Events						
Potential Unwanted Events (PUEs)	Harm due to extreme temperature exposure	Harm due to respirable dust exposure	Harm due to DPMs or other particulates exposure	Harm due to noise exposure	Harm due to whole-body vibration exposure	Harm due to peripheral vibration exposure	Failure of control systems
1. Harm from exposure to health hazards such as a. extreme temperatures b. excessive vibration and noise levels c. respirable dust, DPM and other particulates within the operating workspace due to: I. Inadequate or no climate control II. Inadequate attenuation and restraint systems III. Open windows/doors IV. Inadequate window/door seals	6.1	6.1	6.1	6.1	6.1	6.1	
2. Injury due to failure of critical control systems, such as a. Electronic systems b. Computer systems c. Equipment controls being damaged (bridging, abrasion, etc.) by respirable dust, DPM and/or other particulates entering these systems							6.2
3. Harm from inadvertent exposure to health hazards, including a. respirable dust, DPM or particulate hazards b. fibres in brake and other lining materials c. excessive levels of noise d. excessive vibration due to operators not being aware of deterioration of equipment, such as uncaptured machine degradation, design limits or conditions		6.3	6.3	6.3	6.3	6.3	
4. Harm from noise levels that induce hearing loss, mental and/or physical fatigue for personnel in the workshop and other working environments due to maintenance activities associated with the equipment				6.4			
5. Harm caused by distraction and/or impaired ability to hear audible warnings or alarms (e.g horns, directional reversing alarms) due to a. excessive and/or high impact noise levels generated by equipment b. excessive levels of spectator noise penetrating the operator workspace				6.5			
6. Acute or cumulative musculoskeletal injury, adverse health effects to body organs and increased levels of fatigue from excessive levels of whole-body vibration, especially in conjunction with sustained and/or awkward postures, due to poor ergonomic design of equipment					6.6		

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DP 7. Manual Tasks	Potential Unwanted Events				
Detailed Potential Unwanted Events (PUEs)	Musculoskeletal injury due to exposure to manual tasks risk factors	Caught between/struck by moving parts or tools	Struck by falling materials or liquids	Fall on same level	Fall from heights
1. Musculoskeletal injury from exposure to the following risk factors or combinations thereof: a. forceful exertion b. awkward or static posture c. repetition or prolonged duration d. Hand arm &/or whole body vibration [insert link to WBV DP] (including carrying, lifting, reaching, pushing or pulling, grasping, manipulating, striking, throwing, or holding a load) due to manual tasks associated with installing, operating and maintaining the equipment	7.1				
2. Crush injury occurring during operation and maintenance tasks due to poorly designed crush and pinch point locations		7.2			
3. Injury occurring during operation and maintenance tasks (eg. falling material, handling liquids, machine consumables and spillage) due to no/inadequate design for these activities			7.3		
4. Injury resulting from slips, trips and falls due to uneven work surfaces or platforms				7.4	
5. Injury due to inappropriate access and/or egress [insert link to Access & Working at Heights DP]					7.5
6. Injury due to use of inappropriate tools for manual tasks associated with installing, operating and maintaining the equipment		7.6			
7. Injury during handling of equipment components due to a. excessive weight and/or b. lack of suitable lifting points or hand holds combined with awkward positioning	7.7	7.7			

DP 8. Confined Spaces & Restricted Work Areas	Potential Unwanted Events							
Potential Unwanted Events (PUEs)	Asphyxiation from exposure to irrespirable atmosphere	Harm from excessive heat	Musculoskeletal injury from exposure to manual tasks risk factors	Restricted movement	Harm from fire/ chemical hazards	Contact with hydraulic hoses or piping	Entrapment due to blocked egress	Rescue difficulties
1. Asphyxiation from irrespirable atmosphere due to lack of adequate ventilation	8.1							
2. Harm from excessive heat due to lack of adequate ventilation or proximity to heat radiating components		8.2						
3. Physical injury due to inadequate ergonomic design that restricts worker movement to perform work or access/egress			8.3	8.3				
4. Injury or illness from fire or chemical hazards due to the routing of hosing or piping within confined space					8.4			
5. Burns from contact with hydraulic hoses or piping within confined space						8.5		
6. Harm due to engulfment from materials or inundation by gas or liquids	8.6							
7. Entrapment due to lack of alternate route of egress in an emergency							8.7	
8. Harm due to rescue difficulties associated with difficult or minimal access								8.8

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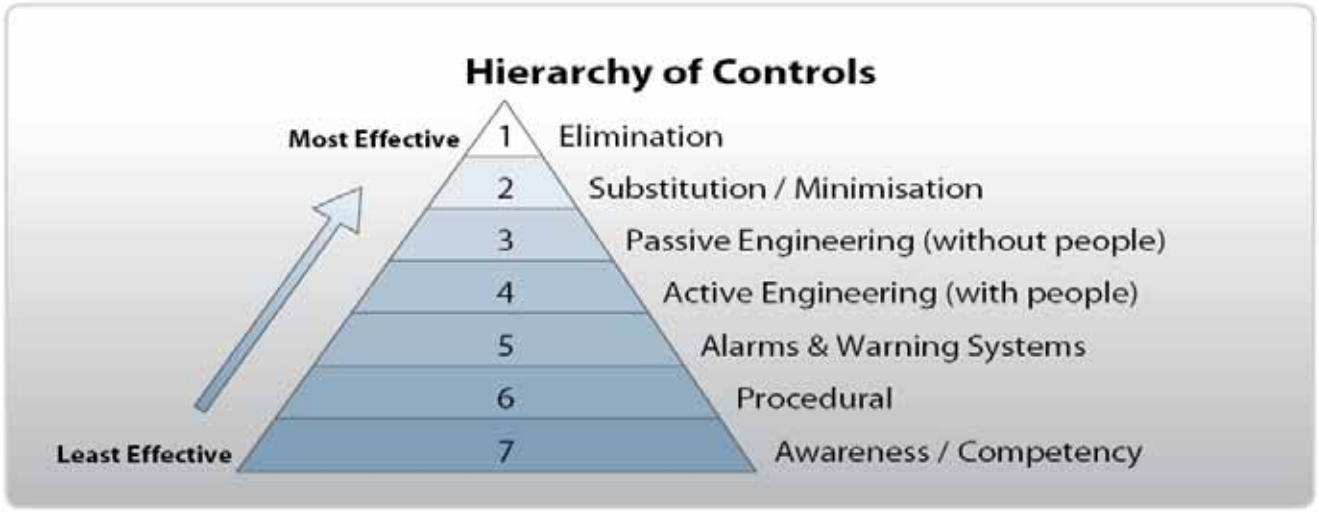
	Consequence				
Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Very Likely	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	Extreme	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Low	Medium	Medium	High
Very Unlikely	Very Low	Low	Low	Medium	Medium



Note that 'Elimination, Substitution and Minimisation' controls refer to the hazard not the unwanted event

PART 2. TASK-BASED RISK ASSESSMENT (TBRA)

							FOR OEM RECORDS ONLY	
Name of Task:							Date:	
Task Process Map Reference:							Location:	
Team:							Facilitator:	
1	2	3	4	5	6	7	8	9
Task Step ID #	Description of Possible Unwanted Event	Relevant DP	Event Likelihood	Inherent Consequences	Risk Ranking	Current Design Controls	Control Intent re: Hierarchy of Control	Suggested New Design Controls

PART 3. INFORMATION FROM THE TASK BASED RISK ASSESSMENT

					FOR THE MINING COMPANY	
1	2	3	4	5	6	7
#	Priority OEM Task from CTI (Part 1)	Relevant EMESRT DP #	Identified Potential Unwanted Events (PUEs)	Features or Controls to Address each PUE	Picture of the Feature or Control	Rationale/evaluation including any assumptions

PLEASE NOTE: These examples are provided for guidance only. Complete forms and source DPs with full detail and all linkages can be viewed and completed electronically on the flash drive.

EDEEP - SAFE DESIGN INFORMATION (to be supplied to potential purchaser)

Equipment Details: Worked example - Integrated Bolter Miner

Risk Assessment reference number:

The information below summarises the outcomes of a task based risk assessment involving experienced mining company-based operational and maintenance staff

Task #	Task	Potential Unwanted Event	EMESRT DP	Design feature/s which control the risk of injury or illness	Evaluation of the design feature/s including reference to additional documentation / reports	Suggested administrative controls
2	Roof bolting	Hazardous Manual Tasks	Manual tasks	Provision of a storage pod allowing bolts and plates and other supplies to be accessed without requring awkward postures. Drill rigs are oriented to place drill head close to platform. Platform space adjacent to bolting rigs is ample to allow miner wearing self-rescuer and battery to get as close as possible to drill head, reducing reach distance to 0.5m. A mesh carrier is provided which allows a mesh to be loaded via LHD and brought forward to the bolting rigs without manual handling. An adjustable height platform is provided to minimise awkward postures associated with reaching roof mesh. Control layout and design allows operation without exposure to awkward postures or forceful exertions.	Attachment A provides general arrangement drawings which illustrates the space available on the platform and at the bolting workstation in relationship to the dimension of a large male wearing self-rescuer and cap lamp battery. The attached manual tasks risk evaluation (Attachment B) provides a detailed analysis of the manual tasks risks conducted by an independent ergonomist which concludes that while a risk of musculoskeletal injury remains as a consequence of the manual bolting process, the engineering controls employed reduce the risk of manual tasks related injuries ALARP. An assessment of the layout of bolting controls as required by MDG35.1 is provided (Attachment C).	Customers should ensure that the bolting supply pod is loaded on to the CM via LHD, and should consider task rotation. Training in the correct use of the platform height adjustment is required.
2	Roof bolting	Struck by materials/ Caught between moving objects	Harmful energies	Two handed control operation is required for fast feed operations. Hydraulic hosing in the operator workstation is behind covers or otherwise protected.	Engineering control prevents the operator from having a hand in a hazardous zone during fast-feed operations. The design meets the requirements of MDG 35.1 and MDG 41(see audits in Attachment D and E respectively).	Training and Supervision to ensure that two-handed operation is not defeated.
2	Roof bolting	Inadvertent or erroneous operation	Machine operation and controls	Guarding is provided to prevent inadvertent operation from falling materials. Controls are shape coded and in consistent locations to reduce selection errors. The controls cannot be interchanged during maintenance. Directional control-response relationships are compatible.	An evaluation of the Human Machine Interface conducted by an independent ergonomist (Attachment F) concludes that while the risk of of inadvertent or erroneous operation remains, it has been reduced to ALARP.	Training, and an objective assessment of operator competency, is recommended prior to operator certification.
2	Roof bolting	Fall on level	Access & WAH	Platform is single level and sufficiently wide to allow miners wearing self-rescuer and battery to walk without turning sideways. Storage locations are provided for dril steels, chemicals, plates etc which do not impinge on the walkway and reduce the risk of tripping hazards. Platform lighting and handrails are provided.	See Attachment A for platform dimensions with respect to maximum likely operator size. Attachment A also provides photographs illustrating the location of bolting supply storage and handrails provided. A lighting survey is provided in Attachment G. These design features reduce the risk of falling on the platform ALARP.	Training and supervision to ensure the platform is maintained clear of materials.

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