



VULCAN MINE

Standard Operating Procedure Guarding



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1. PURPOSE

The purpose of this procedure is to describe requirements associated with machine guarding or fencing at the Vulcan Mine.

This procedure has been developed to ensure compliance with section 67 Machine guarding or fencing of the CMSHR.

A coal mines safety and health management system must provide for minimising the risk to persons from exposed moving or rotating machine components by guarding or fencing the components.

2. SCOPE

This procedure is applicable to all persons at the Vulcan Mine including employees, contractors and visitors.

The controls within this procedure are mandatory.

3. DEFINITIONS

Authorised Person	A person who has the required competencies and who has been appointed by the Site Senior Executive to carry out a designated scope of duties.
CMSHA	Coal Mining Safety and Health Act 1999.
CMSHR	Coal Mining Safety and Health Regulation 2017.
CMW	Coal Mine Worker.
Competent Person	A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly a specified task.
DNRME	Department of Natural Resources, Mines and Energy.
JHA	Job Hazard Analysis.
MOP	Mine Operating Procedure.
OEM	Original Equipment Manufacturer.
SHMS	Safety and Health Management System.
SOP	Standard Operating Procedure.
Take 5	Personal Risk Assessment.

4. PROCEDURE

4.1. RISK MANAGEMENT

Where removal, assembly and modification of guarding is to be conducted onsite or where there is a potential of injury when performing activities, the Risk Management process shall be followed to the level of the task being undertaken in accordance with **VUL-MOP-049-Risk Management**.

The risk management process should consider the following points:

- Control measures for Servicing;
- Control measures for Lubricating;
- Control measures for manual handling;
- Control measures for repairs;
- Electrical equipment and usage;
- Mobile and fixed equipment and usage;
- Housekeeping of the work area;
- Service areas;
- Hazardous substances; and
- Fluid and or oil injection.



NOTE - Workers have an obligation to care for their own health and safety and to not adversely affect the health and safety of other persons. Workers must comply with reasonable instructions, as far as they are reasonably able, and cooperate with reasonable health and safety policies or procedures that has been notified to workers, including information, instructions and training in relation to work carried out by the worker. If personal protective equipment (PPE) is provided, the worker must so far as they are reasonably able, use or wear it in accordance with the information, instructions and training provided.

4.2. Mandatory Requirements

The core mandatory requirements and expectations of Vulcan Mine are that all workers (including internal employees, contractors and visitors) will follow the SHMS as it applies when working. Should a system gap be identified, a supervisor must be notified immediately, and a risk assessment conducted before the work can continue.

Further mandatory requirements identified include the following:

- all workers will comply with CMSHA s. 39 Obligations of persons generally;
- all workers shall be trained, competent and authorised to be on site and to carry out those tasks specific to their role;
- all workers must present themselves in a state fit for duty and unaffected by drugs, alcohol, fatigue and other physical or psychological impairment;
- all workers will conduct a personal risk assessment (i.e. Take 5) prior to undertaking tasks and in the event of a change to the conditions, process or environment;
- there are risk assessments (JHAs) in place under which tasks are being carried out. These risk assessments may indicate controls that go above and beyond the legislative or SHMS requirements and must be followed;
- errant behaviours are prevented through compliance to the training scheme, and managed appropriately through supervision and site discipline procedures;
- at any stage should a worker feel unsafe or at risk when undertaking a task, they are to stop work, make the area safe (if necessary and possible) and immediately report this to their supervisor; and
- if a worker sights another worker undertaking a task, which they feel is unsafe or at risk, that work may be stopped, and a supervisor immediately notified.

4.3. General

Machine guarding shall prevent access to all danger areas that are within the reach of an operator or a CMW in the vicinity. Typical hazards whereby machine guarding may eliminate or reduce risks include:

- drawing in and entanglement;
- friction and abrasion;
- shearing;
- impacting and crushing;
- uncontrolled air or fluid pressure release;
- material propelled or ejected from a machine or process;
- potential energy release (spring release, falling counterweights, etc.); and
- contact with hot or hazardous fluids or components.

4.4. New Machinery

New plant and equipment introduced to the Vulcan Mine shall consider all energy sources and be designed to eliminate the need for guarding where practicable.

Plant and equipment requirements shall be included in tender documentation and supply agreements.

An inspection shall be conducted of machinery arriving at the Vulcan Mine. The inspection shall include the presence of OEM guarding and any modifications to guarding.

This shall be in accordance with VUL-MOP-071-Equipment compliance.



4.5. Prestart Inspection

Prior to commencing work in an area, operators must be satisfied that they are not putting themselves or other persons at an unacceptable level of risk (e.g. prestart inspections, loose fitting protection covers, cables on the ground).

Any missing or damaged guards shall be reported to the Supervisor immediately and appropriate action taken to reduce the risk to personnel (i.e. tag and isolate in accordance with VUL-SOP-078-Isolation and Tagging).

4.6. General Machine Guarding

4.6.1. Guard Design

The design of machine guarding shall be such that the guard does not unnecessarily restrict the operation of the machine. Guards should be easy to remove and install for maintenance purposes.

It is not always practicable to fully guard equipment. Guarding should be such that it does not adversely affect the operation of the machine. In such cases, the machine should be guarded as completely as practicable.

Guard sections or panels shall be designed and manufactured such that it is possible to repeatedly remove and replace them without the likelihood of causing damage to any part of the guarding or nearby machinery.

Guarding shall be of robust construction and securely mounted to:

- resist impact or shock;
- prevent by-passing or disabling of the guard;
- not create a risk in itself (e.g. it must not obstruct operator visibility, weaken the plant, cause discomfort to operators or introduce new hazards such as pinch points, rough or sharp edges);
- be properly maintained;
- control any risk from potential broken or ejected parts and work-pieces;
- allow for servicing, maintenance and repair to be undertaken with relative ease; and
- if guarding is removed the plant shall not be operated other than for live testing purposes.

Physical barriers and guards that are securely fixed in position shall be easy to remove, replace or adjust but only with the aid of a special tool, such as a spanner, Allen key or similar tool, and only when the machine is not in operation. Devices such as wing nuts or wedge inserts, which can be operated using fingers or become stuck, should not be used.

Adjustable guarding provided by the OEM that incorporates movable sections or panels of the guard shall not be tampered with.

4.6.2. Strength Requirements

Guards shall be designed to meet the load and deflection requirements stated in section 3.2.3 of AS 1755.

4.6.3. Materials

Guards generally shall be manufactured from steel sheeting or mesh. Refer to the requirements stated in section 3.2.2 of AS 1755.

4.6.4. Bolting

Bolts, nuts and washers may only be replaced with components compliant with the OEM specifications.

Different types of fasteners shall not be mixed, e.g. a galvanised bolted joint must consist of only galvanised bolts, nuts, and washers.

4.6.5. Photoelectric/Trip Guards/Trip Devices

Trip devices shall be designed so that after operation they may be reset either automatically or manually. Restarting may be automatic where it is safe to do so or may be by means of the normal start button.



Any electrical or electronic trip device shall be designed so that it remains operative during operation of the machinery and is not easily disabled by extraneous influences.

The effective performance of a trip device depends on the stopping characteristics of the machinery, which should be controlled within fine limits. A brake may be necessary.

4.6.6. Emergency Stops

If the design of plant includes an emergency stop control:

- the stop control is prominent, clearly and durably marked, and immediately accessible to each operator of the plant;
- any handle, bar or push button associated with the stop control are coloured red; and
- the stop control cannot be adversely affected by electrical or electronic circuit malfunction.

4.7. Ergonomic Considerations

Minimum safety distances between guards and personnel shall take account of the maximum reach that a person is likely to achieve. A safe maximum reach height above a floor is considered two and a half metres.

Similarly, the sizes and position of openings in guards such as the mesh size or inspection hatch sizes, shall take account of the typical size of human limbs which could be placed through those openings.

All guarding shall be designed to achieve at least the minimum safety distances referred to in AS/NZS 4024.1 for:

- reaching up;
- reaching down and over;
- reaching under;
- reaching around with upper limbs;
- reaching in and through regular openings with upper limbs;
- openings of irregular shape;
- lower limb reach distance; and
- minimum gaps to prevent crushing.

4.8. Labelling of Guards

Where required by a detailed specification, removable guards shall be permanently labelled to indicate potential dangers, safe working procedures, or other relevant information.

Such warning labels shall be clear and concise, using standard symbols (where practicable) and colours in accordance with AS 1319.

4.9. Belt Conveyor Guarding

Guarding of belt conveyors shall be in accordance with AS 1755.

As a minimum, all belt conveyor system parts mentioned in section 3.3 of AS 1755, shall be provided with guards. These include:

- shear and nip points;
- rotating parts;
- hoppers and chutes;
- loading, unloading and discharge points;
- openings in floors;
- falling materials; and
- falling objects.

All belt conveyor guards shall be designed in accordance with AS 1755.

Belt conveyors shall have prestart alarms installed.

Belt conveyors shall have positive lockout mechanisms installed. Section 3.2 of AS 1755 refers to materials and bolting of all belt conveyor guards.

Guards shall meet the minimum strength requirements stated in section 3.2.3 of AS 1755.



The reach dimensions and guard placement requirements stated in section 3.2.4 and Appendix C of AS 1755 shall be met for all guards.

All removable guards shall be labelled at intervals of not greater than ten metres with the words “DANGER – Isolate energy before removing guards”; refer to AS 1755 for information on labelling of guards.

4.10. Maintenance and Replacement of Safeguards

Scheduled inspections and maintenance shall be planned and carried out for rotating equipment and guarding.

Upon completion of any maintenance task on machinery or process plant, a check shall be made to ensure that any safeguard installed has been restored to a fully operational state before signing off the machine for production use.

4.11. Change Management

Any change to a guard shall be risk assessed in accordance with the risk and change management process described in the VUL-MOP-064(3) Change Management.

4.12. Inspection and Maintenance

All machine guarding shall be included in a preventive maintenance program that will include routine inspections and shall be documented on an appropriate form.

Machine guard inspections shall be conducted by a competent trained person, of all exposed and moving machine parts to ensure adequate guarding is in place.

Any defective, missing, faulty or damaged guarding shall be reported immediately after ensuring the affected area is safely barricaded.

Where there is corrosion and paint damage evident on any guards, the Maintenance Supervisor shall be notified so that repair work can be organised.

Where it is necessary to remove machine guards for maintenance purposes, the equipment being protected by the guard shall first be isolated and tagged/locked by personnel conducting the work in accordance with the VUL-SOP-078-Isolation and Tagging.

5. ROLES AND RESPONSIBILITIES

SSE	Shall review and approve this procedure.
HST Manager	Shall ensure that all provisions of this procedure are implemented, and that compliance is achieved.
Managers/Superintendents	Shall be responsible for their area of operations and the implementation and application of this procedure; Provide adequate training, information, structure and supervision to ensure that this procedure is implemented; Carry-out a periodic review of activities to ensure the appropriate application and understanding of this procedure; and Ensure immediate and appropriate steps are taken to investigate and rectify any risks to health and safety arising from these activities.
Supervisors	Ensure all CMWs are familiar with, have access to and comply with the requirements set out in this procedure.
All CMWs (including visitors and contactor)	Shall comply with the requirements of this procedure.



6. REFERENCES

- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)
- AS 1319-1994 (R2018) Safety signs for the occupational environment
- AS 1543-1985 Electrical equipment of industrial machines
- AS 1755-2000 Conveyors- Safety requirements
- AS/NZS 4024.1-2019 Series – Safety of machinery
- VUL-MOP-064(3) Change Management
- VUL-SOP-078-Isolation and Tagging

7. REVIEW

This document shall be reviewed at a minimum every two years, or as follows:

- when there is a change of method and/or technology and/or legal or other requirement that may affect the accuracy of this document;
- when operational changes occur that effect the currency of the document;
- when there has been a significant event to which this document was relevant; and
- as a result of relevant audit findings.

8. DOCUMENT CONTROL

Version	Date	Description	Document Controller
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