



VULCAN MINE

Standard Operating Procedure

Electrical and Mechanical Equipment used to Maintain Plant



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1. PURPOSE

The purpose of this procedure is to specify requirements and to manage the hazards and risks associated with mechanical test equipment at the Vulcan Mine.

2. SCOPE

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

The controls within this SOP 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	Queensland Coal Mining Safety and Health Act (1999).
CMSHR	Queensland Coal Mining Safety and Health Regulation (2017).
Competent Person	Competence for a task at a coal mine is the demonstrated skill and knowledge required to carry out the task to a standard necessary for the safety and health of persons. The CMW must be assessed as competent and authorised by the SSE or SSE delegate to perform the task.
EEM	Electrical Engineering Manager.
Electrical Worker	A person who has the required competencies and who has been appointed by the EEM and SSE to undertake Electrical Work on site.
HV	High Voltage.
IEC	International Electrotechnical Commission.
JHA	Job Hazard Analysis.
NDT	Non-destructive testing.
OEM	Original Equipment Manufacturer.
PPE	Personal Protective Equipment.
SOP	Standard Operating Procedure.
SHMS	Safety and Health Management System.
SSE	Site Senior Executive.
Take 5	Personal Risk Assessment.

4. PROCEDURE

4.1. Equipment Selection

Selection of electrical and mechanical equipment shall only be performed by a competent person to ensure it is correct for the application. Where there is a relevant standard pertaining to a piece of equipment, only equipment that is compliant to that standard shall be selected.

Where no Australian Standard exists for electrical equipment, then equipment complying with an IEC may be selected in accordance with VUL-FRM-02-Change Management Approval. The selected electrical equipment shall be approved by the EEM and the SSE.

When selecting equipment, consideration shall be given to the task, the equipment design and intended purpose. This equipment can be found in the relevant register. For equipment use not outlined in a relevant SWP prescribing its safe operation, a risk assessment must be completed.



4.1.1. Maintaining Equipment

All equipment shall be maintained as per the OEM's instructions or recommendations.

After using the equipment, it should be cleaned, inspected, and stored in the relevant storage location.

4.1.2. Faults and Repairs

Faulty equipment shall not be utilised and shall be removed from service. Equipment that can be repaired shall be repaired by a competent and authorised person. Equipment that cannot be repaired shall be permanently removed from service by being destroyed or made inoperable.

4.1.3. Records

Where an inspection is required to be recorded, the results of the inspection shall be kept in the relevant Logbook or Register. Equipment compliance test and tag must include test date (minimum month and year) and / or the next scheduled test date. Any faults or defects shall be recorded and actioned to have the equipment repaired.

Reports and certificates of the inspection/testing/calibration shall be provided to site and kept with the records of the equipment.

4.2. Equipment Used for Maintaining Plant

- All electrical safety equipment must be approved by the EEM or delegate and comply with the relevant Australian or International Standards.
- Selection of electrical safety equipment must only be performed by an electrical worker to ensure it is correct for the application and consideration must be given to the following:
 - voltage to be worked on;
 - fault levels at work site;
 - type of work to be carried out;
 - conditions at work site (e.g. environmental conditions); and
 - arc fault levels.
- Electrical safety equipment must be tested and a register maintained in accordance with VUL-SOP-021- Electrical Work (Low Voltage) (refer to the table in Appendix F: Electrical Safety Equipment Test and Register) and relevant Industry Standards.
- Electrical safety equipment compliance test and tag must include test date (minimum month and year) and / or the next scheduled test date. Test equipment which is used to test that plant has been de-energised must be tested on a known source before and, when possible, after use. When testing, caution must be taken where stored energy may be present such as in capacitive devices or from induced voltages.
- A non-contact tester should be used prior to contact testing.
- Fit for purpose insulated hand tools must be used where there is a potential for electrical contact.
- Tools must be inspected before use, and if found to be damaged or in any way unsafe, must be replaced or repaired.
- Meters used for live testing must provide adequate short circuit protection for the fault levels of equipment being tested and rated Cat III-1000. All clips and sockets must be of an insulated type.
- Insulated or non-conductive ladders must be used for electrical work and used in accordance with VUL-SOP-092 Working at Heights.
- LV rescue kits must be readily accessible at all LV restricted electrical operating areas.



4.3. Safe Use of Testing Equipment

4.3.1. Mechanical Test Equipment

The following requirements apply to the use of mechanical testing equipment:

- testing equipment shall be fit for purpose and used within its range limitations;
- where testing equipment is not working or displays an obviously incorrect reading, the equipment shall not be used until either:
 - the unit has been repaired by a competent person; or
 - the unit has been replaced and installed by a competent person;
- where use of mechanical testing has the potential to adversely affect the safety of other personnel in the work area, the area shall be demarcated and suitable signs erected restricting entry;
- where mechanical testing equipment is used on items of plant containing stored energy and where the stored energy is not required as a component of the test, it shall be released to zero potential;
- where mechanical testing takes place on plant that has moving components with the potential for uncontrolled movement of components, they shall be grounded, isolated, or supported in such a manner as to prevent any uncontrolled movement, unless it is a requirement of the test and the risk managed in other ways;
- items of mobile plant shall be fundamentally stable before any mechanical testing takes place, unless requirements of the testing preclude this (e.g. dynamic brake testing; and
- suitable PPE shall be always worn when using test equipment and in accordance with VUL-SOP-065 Personal Protective Equipment (PPE).

4.3.2. Electrical Test Equipment

Energised HV enclosures must not be opened.

When live testing (including infrared scanning) a minimum of two competent electrical personnel must complete a JHA to determine controls. The following must be taken, into account:

- a LV rescue kit must be placed as close as practical to the job;
- a safety observer (Electrical), must be in attendance for all live testing;
- communicate with the operator as to the extent and nature of live testing to be performed;
- instruct the electrical support worker of any potential hazards and controls;
- identify the terminals to which probes are to be attached. Always refer to drawings;
- close and latch any doors not required to be open and secure any doors required to be left open to prevent them from swinging when machine operates;
- ensure all unnecessary personnel are clear of the test area, rope or barricade area if necessary;
- arc fault levels and required PPE; and
- potential for fire and burns (i.e. fire extinguisher and burns gel).

Where the panel remains energised only cubicle(s) being worked on may be open at any one time for checking and must be closed before leaving area. Door interlocks may be defeated for the purpose, of live testing or infra-red scanning. Follow bridging process as detailed in Section 7.3 Modification of Electrical Control Systems of VUL-SOP-021-Electrical Work (Low Voltage).

All mobile equipment must be parked and isolated in accordance with VUL-SOP-078 Isolation and Tagging before terminal inspection plates are removed. The machine may then be put back to work while checks are made. After completion of checks, the machine must be parked and isolated again before covers are refitted.

Adequate precautions should be taken to ensure persons make themselves stable when carrying out scanning and live testing to the extent of stopping the machine moving or working if necessary.



5. ROLES AND RESPONSIBILITIES

SSE	Shall review and approve this procedure.
HST Superintendent	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

- AS/NZS 3007:2013 Electrical equipment in mines and quarries – Surface installations and associated processing plant
- AS /NZS 4836:2023 Safe work on or near low-voltage electrical installations and equipment
- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)
- Electricity Act 2002 (Qld)
- Electricity Regulations 2013 (Qld)
- IEC 61010-1: 3.1 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General Requirements
- VUL-SOP-065 Personal Protective Equipment
- VUL-SOP-078 Isolation and Tagging
- VUL-SOP-092 Working at Heights
- VUL-PLN-021-Electrical Management Plan

7. REVIEW

This document shall be reviewed at a minimum two yearly, 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. AMENDMENTS

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