



Electrical Energy
Doc No: CMR WHS STD 009

Table of Contents

1.	Introduction	3
1.1	Purpose	3
1.2	Scope	3
1.3	Authorised Person	3
2.	Critical Control Implementation	3
2.1	Low voltage electrical work requirements	3
2.1.1	Develop Safe Work Method Statement	3
2.1.2	Minimum licencing requirements	4
2.1.3	Minimum first aid certification requirements	4
2.2	Manage electrical energy isolation	4
2.2.1	Isolate electrical energy	4
2.2.2	Prove the equipment or installation is de-energised	4
2.2.3	Permit to work requirements	5
2.3	High voltage electrical work requirements	5
2.3.1	Live high voltage works	5
2.3.2	Authorise High Voltage Switchers	5
2.3.3	Use approved high voltage switching sheet	5
2.3.4	Confirm earthing requirements	6
2.4	Manage portable electrical equipment	6
2.4.1	Minimum requirements for portable electrical equipment	6
2.4.2	Construction test and tag requirements	7
2.4.3	Requirements for Residual Current Devices (RCD)	7
2.4.4	Using generators	8
2.4.5	Electrical certificate of compliance	8
2.5	Emergency Rescue Requirements	8
2.5.1	Develop procedures	8
2.5.2	Implement procedures	8

1. Introduction

1.1 Purpose

The purpose of this standard is to provide guidance on how to:

- Manage the risks associated with electricity. This is supported by the Electrical Energy Bow Tie Risk Assessment.
- Implement the Electrical Core Mandatory Requirement (CMR). This is supported by CMR FRM 009a Electrical Energy Critical Controls.

1.2 Scope

In scope - All MPC Kinetic controlled work sites.

Out of Scope – Works outside of MPC Kinetic control.

1.3 Authorised Person

All Field Employees and Contractors who are:

- Authorised Electricians
 - Authorised High Voltage Switching Operator
 - Authorised to work on an electrical installation under a permit to work.
-

2. Critical Control Implementation

2.1 Low voltage electrical work requirements

2.1.1 Develop Safe Work Method Statement

A documented Safe Work Method Statement (SWMS) or equivalent must be developed to eliminate or minimise the risks associated with working on electrical installations.

The content of the risk assessment must be developed after reviewing the hazards, risks and control measures documented in the relevant HSE Risk Register.

The hierarchy of risk controls must be applied to ensure the risks are minimised so far as is reasonably practicable.

Work must not occur on energised electrical equipment, unless:

- It is necessary in the interests of health and safety
- It is necessary so the work can be carried out properly
- It is necessary for the purposes of testing
- There is no reasonable alternative means of carrying out the work.

If the work requires the installation or equipment to be energised, the risk assessment must be approved by the Project / Operations Manager.

Electrical Energy Standard

- 2.1.2 Minimum licencing requirements**
- All persons conducting electrical work must be licenced for the work they are doing. This may include:
- Electrical Mechanic
 - Electrical Fitter
 - Electrical Jointer
 - A person with a Restricted Electrical Licence that covers the task to be performed.
- The licencing requirements must be confirmed based on the local legislative requirements.

- 2.1.3 Minimum first aid certification requirements**
- To maintain a license, all electricians must have these current certifications:

Course name	Competency Code	Refresh
Perform rescue from a live LV panel	UETDRRF06 or equivalent	12 months
CPR	HLTAID001	12 months

2.2 Manage electrical energy isolation

- 2.2.1 Isolate electrical energy**
- All electrical equipment and installations must be considered energised until isolated and proven de-energised.
- Effective electrical isolation must be completed by:
- Only authorized personnel must undertake the isolation
 - Positively identified all the energy sources and isolation points
 - Disconnect energy sources
 - Isolate and discharge all sources of electrical energy
 - Secure the isolation with a lock out device
 - Attach danger tags and notices
 - Prove the system is de-energised.

- 2.2.2 Prove the equipment or installation is de-energised**
- The equipment or installation must be proven de-energised using a calibrated testing device.
- The voltage testing device must be rated to a Category 3 or 4.
- Any voltage tests used to prove de-energisation must be conducted in the following sequence:
1. Test the voltage tester on a known voltage source
 2. Test between all conductors and a known earth
 3. Test between all conductors

Electrical Energy Standard

- 2.2.3 Permit to work requirements** All work that requires isolation of electrical energy must be conducted under an isolation permit.

The permit must be issued in accordance with WHS PRO 056 Permit to Work Procedure / equivalent BU procedure or client requirements.

The permit must be in writing and as a minimum contain:

- A record of isolation points
- Details of the locks attached
- The name of the person who conducted the isolation
- The name of the person who verified the isolation
- A list of personnel who will be working on the equipment.



NOTE: Refer to:

- WHS PRO 053 Permit to Work Procedure.

2.3 High voltage electrical work requirements

- 2.3.1 Live high voltage works** Under no circumstance can live high voltage works be done.

- 2.3.2 Authorise High Voltage Switchers** All high voltage switching activities must be controlled by an Authorised High Voltage Switching Operator.

The person must have:

- Met specific training and competency requirements
- Demonstrated experience in HV Switching
- Formal approval from the asset owner or electrical authority.

- 2.3.3 Use approved high voltage switching sheet** An approved high voltage switching sheet must be used.

A High Voltage Switching Sheet must define the sequence to to:

- Isolate the energy
- Test the system is de-energised
- Meet earthing requirements.

Under no circumstances may an approved High Voltage Switching Sheet be modified.

To confirm the safe switching operation, two (2) Authorised High Voltage Switching Operators are required:

- One (1) Authorised High Voltage Switching Operator will follow the switching sheet and complete the work
- One (1) Authorised High Voltage Switching Operator confirms the switching is effective.

Electrical Energy Standard

2.3.4 Confirm earthing requirements

The Authorised High Voltage Switching Operator must confirm that all earthing requirements are met.

Earthing of high voltage electrical equipment can be achieved by:

- Permanent installation of earthing switches
- Circuit breakers
- Applying portable earths.

If portable earths are used, they must be applied as soon as the conductors have been discharged and proven de-energised.

Portable earths clamps or flexible cords must be:

- Suitable for the task
- Have adequate capacity to withstand normal short circuit conditions.

All attempts must be made to attach earth clamps to a permanent earth such as:

- A substation earthing system
- A transmission tower leg
- Transmission pole earth wire.

Where it's not possible to use a permanent earth, one or more earth stakes must be used as a temporary earth.

Earth stakes must be driven at least 0.6 metres vertically into the ground at a point near the base of the pole, tower or structure.

2.4 Manage portable electrical equipment

2.4.1 Minimum requirements for portable electrical equipment

All portable electrical equipment must be RCD protected, tested and tagged.

Flexible leads used to connect portable electrical equipment must be protected from damage. This may include:

- Using insulated cable hooks or stands to store off the ground.

Electrical Energy Standard

2.4.2 Construction test and tag requirements

All portable electrical equipment and tools used in a construction workplace must be tested and tagged.

A durable tag must be attached to the equipment, stating:

- The name of the person or company who performed the test
- The date of the testing
- The date on which the next testing must be carried out
- Reference to AS/NZS 3760.

The tag must be colour-coded to show when the test was performed.

Start Month	Finish Month	Colour
December	February	Red
March	May	Green
June	August	Blue
September	November	Yellow

If flexible leads are damaged or fail test, they must be immediately removed from use and replaced.

2.4.3 Requirements for Residual Current Devices (RCD)

All mains powered portable equipment, operating at above extra low voltage, must be protected by a Residual Current Device (RCD).

RCD's must be tested according to AS/NZS 3190 Approval and test specification - Residual current devices.

Class of Work	Type 1 or 2 - Fixed RCD	Type 1 or 2 - Portable RCD
Construction work, including demountable offices, crib rooms, amenities, portable structures and equipment	Use the inbuilt test button at least monthly. An operating time/current test by a competent person at least annually.	Use the inbuilt test button – immediately after it is connected and immediately before it used, first time each day. By a competent person, at least every 3 months.
Office work	Use the inbuilt test button at least every 6 months. An operating time/current test by a competent person, at least every 2 years.	Use the inbuilt test button at least every 3 months. An operating time/current test by a competent person at least every 2 years.

A record of testing (other than daily testing) must be kept until the next test, or the device is disposed of.

If a protection device is found to be faulty, it must be removed from use and replaced.

Electrical Energy Standard

- 2.4.4 Using generators**
- Generators used to supply power to fixed electrical installations must be connected by an authorized electrician in accordance with AS/NZS 3000.
- Generators must have RCD protected outlet/s.
- Permanently connected generators must have an earth electrode installed at a minimum depth of 1.2m. When testing the earth electrode resistance, the result must be less than 200Ω.
- Electrical verification of portable generators must be carried out in accordance with AS/NZS 3012.
-

- 2.4.5 Electrical certificate of compliance**
- All electrical installations must be provided with an electrical Certificate of Compliance before use.
- All permanent or temporary electrical installations must:
- Be installed by licenced electricians
 - Comply with AS/NZS 3000 and/or AS/NZS 3012
 - Certificate of Compliance must be issued by the companies Qualified Technical Person(s)
 - Records must be kept in companies Document Management System
 - Have undergone the required tests and inspections before use.
-

2.5 Emergency Rescue Requirements

- 2.5.1 Develop procedures**
- Emergency response procedures must be developed based on the risks associated with the electrical work.
- The potential emergencies related to electrical work, include:
- Electric shock
 - Arc flash burns.
-

- 2.5.2 Implement procedures**
- Emergency response procedures must be implemented on-site.
- This includes:
- Communicating procedures to the relevant site personnel
 - Confirming or arranging specific emergency response training
 - Arranging relevant emergency equipment e.g. low voltage rescue kits or appropriate equipment for voltage.
- The emergency procedures must be checked they are working effectively. This includes:
- Undertaking drills or scenario testing
 - Conducting regular inspections.
-