

CMR 009 – Electrical Energy Standard
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1. Purpose

MPC Kinetic (MPK) consider electrical energy as one of its highest risk activities undertaken within its operations. Within the business these high-risk activities are referred to as Core Mandatory Requirements (CMR's). CMR's focus on the critical controls required to manage high-risk activities and allow our personnel to make informed decisions to manage those risks effectively.

The purpose of CMR 009 – Electrical Energy Standard is to provide guidance on how to

- Manage the risks associated with electrical energy, which is supported by the electrical energy bow tie risk assessment
- Implement the Electrical Energy Core Mandatory Requirement (CMR). This is supported by GRP-CMR-FRM-009 Electrical Energy Critical Controls.

2. Scope

The scope of this standard applies to all MPK Employees and Sub-Contractors who are involved with electrical energy activities for MPK operations within all MPK controlled work sites.

Note: works outside of MPK control is not considered in scope

3. Reference Documents

Document Name
GRP-CMR-FRM-009 Electrical Energy Critical Controls.

4. Critical Control Implementation

4.1 Low Voltage Electrical Work Requirements

4.1.1 Develop Safe Work Method Statement (SWMS)

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.

4.1.2 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

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A person with a Restricted Electrical Licence that covers the task to be performed.

The licensing requirements must be confirmed based on the local legislative requirements.

4.1.3 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

4.2 Manage Electrical Isolation

4.2.1 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 authorised 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

4.2.2 Prove the Equipment of 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

4.2.3 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 MPK's 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

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4.3 High Voltage Electrical Work Requirements

4.3.1 Live High Voltage Works

Under no circumstance can live high voltage works be done.

4.3.2 Authorise High Voltage Switches

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

4.3.3 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:

- 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

4.3.4 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.

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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.

4.4 Manage Portable Electrical Equipment

4.4.1 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

4.4.2 Construction Test & 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:

- Name of the person or company who performed the test
- Date of the testing
- 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.

4.4.3 Requirements for Residual Current Devices (RCDs)

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 is 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.

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4.4.4 Using Generators

Generators used to supply power to fixed electrical installations must be connected by an authorised 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.

4.4.5 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

4.5 Emergency Rescue Requirements

4.5.1 Develop ER Plan

Emergency response plans 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

4.5.2 Implement ER Plans

Emergency response plans must be implemented on-site.

This includes:

- Communicating plans 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 plans must be checked they are working effectively. This includes:

- Undertaking drills or scenario testing
- Conducting regular inspections