

Electrical Safety Procedure

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Description	This document outlines the Griffith University procedure for ensuring electrical safety compliance within the workplace.

Related documents

[Construction Work Policy](#)

[Electrical Safety Procedure \(Test & Tag\)](#)

[Health and Safety Policy](#)

[Risk Management Policy](#)

[Reporting and Recording Procedures for incidents, injuries, dangerous incidents, hazards and near misses](#)

[Incident Reporting on GSafe](#)

Campus Life Intranet

CLF-SAF-BPM-002	Electrical Safety Work Flowchart
CLF-SAF-FRM-010	Certificate of Electrical Testing and Compliance Form
CLF-SAF-GDE-003	Portable Ladders Guideline
CLF-SAF-GDE-004	Personnel Protective Equipment Guideline
CLF-SAF-GDE-011	Electric Arc Flash Protection Guideline
CLF-SAF-PER-004	Excavation and Trenching Permit
CLF-SAF-PER-005	Working near OH Lines and LV Installations Permit
CLF-SAF-PER-006	Services Isolation Permit
CLF-SAF-PER-007	Authorised Removal of Personal Danger Tag and Lock Permit
CLF-SAF-PER-008	Live Work, Fault Finding and Testing Permit
CLF-SAF-PER-009	HV Installation Access Permit to Perform HV Work (contractor only)
CLF-SAF-SOP-008	Isolation, Lock-Out, Tag-Out Procedure
CLF-SAF-SOP-009	Live Work, Fault Finding and Testing Procedure
CLF-SAF-SOP-010	Working in Vicinity of Overhead Lines or Underground Cables Procedure
CLF-SAF-SOP-011	Certificate of Electrical Safety Compliance Procedure
CLF-SAF-SOP-012	Electrical Test Instrument and Safety Equipment Maintenance Procedure
CLF-SAF-SOP-013	Personnel Protective Equipment Procedure
CLF-SAF-SWMS-006	Services Isolation, Lock-Out Tag-Out SWMS
CLF-SAF-SWMS-007	Live Work, Fault Finding and Testing SWMS
CLF-SAF-SWMS-008	Excavation, Trenching and Working near Underground Services SWMS
CLF-SAF-SWMS-009	Operating Plant near Overhead Lines SWMS
CLF-SAF-SWMS-011	Clearing Vegetation near Overhead Lines and Structures SWMS
CLF-SAF-SWMS-012	Testing to Connect to Electricity Supply SWMS

Queensland Legislation

[Work Health & Safety Act 2011](#)

[Work Health & Safety Regulation 2011](#)

[Electrical Safety Act 2002](#)

[Electrical Safety Regulation 2013](#)

Queensland Codes of Practice

[Electrical safety code of practice 2013 - Managing electrical risks in the workplace](#)

[Electrical safety code of practice 2010 - Working near overhead and underground electric lines](#)

[Electrical safety code of practice 2010 – Works](#)

SAIGLOBAL - Australian Standards

[AS/NZS 3000:2018](#) Electrical installations (the Wiring Rules)

[AS/NZS 3003:2018](#) Electrical installations - Patient areas

[AS/NZS 3012:2010](#) Electrical installations - Construction and demolition sites

[AS/NZS 3017:2007](#) Electrical installations - Verification guidelines

[AS/NZS 3105:2014](#) Approval and test specification - Electrical portable outlet devices

[AS/NZS 3551:2012](#) Management programs for medical equipment

[AS/NZS 3760:2010](#) In-service safety inspection and testing of electrical equipment

[AS/NZS 4513:1995](#) Medical Electrical Equipment - Fundamental aspects of safety standards

[AS/NZS 4836:2011](#) Safe Work: Safe working on or near low-voltage electrical installations and equipment

[AS/NZS 5761:2011](#) In-service safety inspection and testing - Second-hand electrical equipment prior to sale

[AS/NZS 5762:2011](#) In-service safety inspection and testing - Repaired electrical equipment

[AS/NZS IEC 60601.1:2015](#) Medical Electrical Equipment - General Requirements for Basic Safety and Essential Performance

Industry Guidelines

[Electricity Hazard Guide \(Live Performance Australia\)](#)

[Safety Guidelines for the Entertainment Industry](#) - 24 August 2001 (Australian Entertainment Industry Association and the Media Entertainment and Arts Alliance)

Manufacturer's instructions for different types of calibrated equipment

[\[Definitions\]](#) [\[Purpose\]](#) [\[Scope\]](#) [\[Roles & Responsibilities\]](#) [\[General Requirements\]](#) [\[General Electrical Equipment Survey\]](#) [\[Procurement of Electrical Equipment\]](#) [\[Design & Manufacture of Electrical Equipment\]](#) [\[Electrical Work\]](#) [\[Electrical Work on Energised Electrical Equipment\]](#) [\[Power Outlets & Safety Switches\]](#) [\[Specific Situations & Responsibilities\]](#) [\[Electrical Test Instruments\]](#) [\[Incident Notification & Reporting\]](#) [\[Review of Electrical Safety Compliance\]](#) [\[Appendix A Guide to Labelling & Compliance Markings\]](#)

1. DEFINITIONS

1.1 Approved Testing Entity

As per the *Electrical Safety Regulation 2013 (schedule 9)*, an *Approved Testing Entity*, for a test or examination, means—

- (a) a body accredited by the National Association of Testing Authorities, Australia ABN 59 004 379 74 (NATA) to perform the test or examination; or
- (b) a body accredited by another body, operating under a reciprocal agreement with NATA, to perform the test or examination; or
- (c) a body approved by the regulator to perform the test or examination; or

- (d) a body approved to perform the relevant test or examination under a corresponding law.

1.1.1 Competent person

Competent person, in relation to a task, means a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill to carry out the task.

Note: Electrical work may only be performed by a person if the person -

- (a) is the holder of an appropriate electrical licence authorising the work; or
(b) is otherwise authorised to perform the work under the Electrical Safety Act s55(3)(d).

e.g. the authorised testing of electrical equipment (test and Tag) of specified electrical equipment or hire equipment

Competent person (Test and Tag) means:

- (a) a person who has the necessary practical and theoretical skills, acquired through training, qualification, experience or combination of these, to undertake correctly the required tasks, and for testing and tagging, and
(b) has completed the required national competencies to be deemed competent in accordance with AS/NZS 3760 and AS/NZS 3012, and/or
(c) if the test and tag is for medical equipment, completed a course of instruction to AS/NZS 3551.

Note: Additional or different competencies may be required for more complex kinds of testing outside the scope of AS/NZS 3760.

1.2 Dangerous Electrical Event

As per the *Electrical Safety Act 2002 (s12)*, is any of the following:

- (a) the coming into existence of circumstances in which a person is not electrically safe, if—
(i) the circumstances involve high voltage electrical equipment; and
(ii) despite the coming into existence of the circumstances, the person does not receive a shock or injury;
- (b) the coming into existence of both of the following circumstances—
(i) if a person had been at a particular place at a particular time, the person would not have been electrically safe;
(ii) the person would not have been electrically safe because of circumstances involving high voltage electrical equipment;
- (c) an event that involves electrical equipment and in which significant property damage is caused directly by electricity or originates from electricity;
- (d) the performance of electrical work by a person not authorised under an electrical work licence to perform the work;
- (e) the performance of electrical work by a person if, as a result of the performance of the work, a person or property is not electrically safe;

Examples for paragraph (e)—

- *the connection of electrical equipment to a source of supply involving incorrect polarity or other incorrect connection*
 - *the performance of electrical work as a result of which an exposed wire is left in circumstances in which it can be energised by the operation of a switch or circuit breaker or the insertion of a fuse*
- (f) the discovery by a licensed electrical worker of electrical equipment that has not been marked as required under this Act.

1.3 Duty to Notify

As per the Electrical Safety Regulation 2013 (s265)

- (a) A person who conducts a business or undertaking (PCBU) must ensure that the regulator is notified, in a way that complies with subsections (2) to (4) and by the fastest means possible, immediately after becoming aware that a serious electrical incident or dangerous electrical event arising out of the conduct of the business or undertaking has occurred.
- (b) The notice must be given—
 - (i) by telephone; or
 - (ii) in writing.
- (c) A person giving notice by telephone must give the details of the incident or event; and if required by the Regulator give written notice within 48 hours after the requirement is made.
- (d) A written notice must be in a form, or contain the details, approved by the regulator.
- (e) A PCBU must keep a record of each serious electrical incident or dangerous electrical event for at least 5 years.

1.4 Electrical Appliance

As per the *Electrical Safety Act 2002 (Schedule 2)*:

- (a) An appliance is a device that consumes electricity at a voltage greater than extra low voltage and in which the electricity is converted into heat, motion or another form of energy or is substantially changed in its electrical character.
- (b) Although a light fitting, including its bulb or tube, is an appliance, the bulb or tube, taken alone, is not an appliance.

1.5 Electrical Engineer

As per the *Electrical Safety Act 2002*

- (a) a person who is a registered professional engineer under the Professional Engineers Act 2002 and who is registered in the area or preserved area of electrical engineering under that Act; or
- (b) a person who held a degree in electrical engineering granted by—
 - (i) an approved school of engineering under the repealed Professional Engineers Act 1988; or
 - (ii) an approved faculty of engineering under the repealed Professional Engineers Act 1988; before the repeal of that Act and who continues to hold the degree; or
- (c) a person who held, immediately before the commencement of the Professional Engineers and Other Legislation Amendment Act 2008, and continues to hold, a qualification in electrical engineering granted by a tertiary education institution that entitled the person to be admitted to the Institution of Engineers Australia, as a graduate member, and transitioning to a RPEQ

1.6 Electrical Equipment

As per the *Electrical Safety Act 2002 (s14)*

- (a) means any apparatus, appliance, cable, conductor, fitting, insulator, material, meter or wire that—
 - (i) is used for controlling, generating, supplying, transforming or transmitting electricity at a voltage greater than extra low voltage; or
 - (ii) is operated by electricity at a voltage greater than extra-low voltage; or

- (iii) is part of an electrical installation located in an area in which the atmosphere presents a risk to health and safety from fire or explosion; or
- (iv) is, or is part of, a cathodic protection system.

1.7 Electrical Infrastructure

Electrical Infrastructure includes an electrical installation, electrical equipment, electrical line or associated equipment for an electrical line.

1.8 Electrical Installation

As per the *Electrical Safety Act 2002 (s15)*

- (a) An electrical installation is a group of items of electrical equipment that—
 - (v) are permanently electrically connected together; and
 - (vi) can be supplied with electricity from the works of an electricity entity or from a generating source; and
 - (vii) do not include items that are works of an electricity entity.
- (b) An item of electrical equipment may be part of more than 1 electrical installation
- (c) In subsection (1)(a)—
 - (i) an item of electrical equipment connected to electricity by a plug and socket outlet is not permanently electrically connected; and
 - (ii) connection achieved through using works of an electricity entity is not a consideration in determining whether or not electrical equipment is electrically connected.

1.9 Electrical Risk

As per the *Electrical Safety Act 2002 (s10(1))*

- (a) in relation to a person, the risk to the person of death, shock or injury caused directly by electricity or originating from electricity; or
- (b) in relation to property, the risk to the property of—
 - (i) damage caused by a cathodic protection system; or
 - (ii) loss or damage caused directly by electricity or originating from electricity.

1.10 Electrically Safe

As per the *Electrical Safety Act 2002 (s10(2))* means,

- (a) for a person or property, that the person or property is free from electrical risk, and
- (b) for electrical equipment or an electrical installation, that all persons and property are free from electrical risk from the equipment or installation, and
- (c) for the way electrical equipment, an electrical installation or the works of an electricity entity are operated or used, that all persons and property are free from electrical risk from the operation or use of the equipment, installation or works; and
- (d) for the way electrical work is performed, that all persons are free from electrical risk from the performance of the work, and
- (e) for the way a business or undertaking is conducted, that all persons are free from electrical risk from the conduct of the business or undertaking, and
- (f) for the way electrical equipment or an electrical installation is installed or repaired, that all persons are free from electrical risk from the installing or repairing of the equipment or installation.

1.11 Electrical Safety

As per the *Electrical Safety Act 2002 (s10 (3))*, means a person or property is electrically safe.

1.12 Energised Electrical Work

Energised electrical work means electrical work carried out in circumstances where the part of electrical equipment being worked on is connected to electricity or 'energised' [Code of Practice 2013 - Managing electrical risks in the workplace].

1.13 Electrical Work

As per the *Electrical Safety Act 2002* (s18)

- (a) connecting electricity supply wiring to electrical equipment or disconnecting electricity supply wiring from electrical equipment; or
- (b) manufacturing, constructing, installing, removing, adding, testing, replacing, repairing, altering or maintaining electrical equipment or an electrical installation.

Examples of electrical work—

- installing low voltage electrical wiring in a building
- installing electrical equipment into an installation coupler or interconnector
- replacing a low voltage electrical component of a washing machine
- maintaining an electricity entity's overhead distribution system

1.14 Entertainment activities

Includes stage operations of any kind whether or not at an internal or external venue

1.15 Entertainment venue

Any place where a performance is conducted

1.16 Electrical Voltage

1.16.1 Extra Low Voltage (ELV)

As per the *Electrical Safety Act 2002 (Schedule 2 (S8))* means voltage of 50V or less AC RMS, or 120V or less ripple-free DC

1.16.2 Low Voltage (LV)

As per the *Electrical Safety Act 2002 (Schedule 2 (S8))* means voltage greater than extra low voltage, but not more than 1000V AC RMS or 1500V ripple-free DC

1.16.3 High Voltage (HV)

As per the *Electrical Safety Act 2002 (Schedule 2 (S8))* means voltage greater than low voltage

1.17 Free from Electrical Risk

As per the *Electrical Safety Act 2002 (s10 (2)(4))*

- (a) Electrical risk to the person or property has been eliminated, so far as is reasonably practicable; or
- (b) If it is not reasonably practicable to eliminate electrical risk to the person or property, the risk has been minimised so far as is reasonably practicable

1.18 Hazardous Areas

- (a) an explosive gas is present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant; or
- (b) a combustible dust is present, or could reasonably be expected to be present, in the atmosphere in a quantity that requires special precautions to be taken for the construction and use of plant.

1.19 Hire Equipment

A hire situation is created when the hirer provides electrical equipment, to a person or entity external to the hirer's organization, which passes out of the control of the hirer. This excludes equipment that is being lent to Griffith University students/staff.

1.20 Hostile Operating Environments

Hostile Operating Environments are those where operating conditions are likely to damage the equipment or reduce its life span. This includes conditions that expose the equipment to moisture, heat, vibration, mechanical damage, corrosive chemicals and dust. Examples include: wet or dusty areas, outdoors, workplaces that use corrosive substances, commercial kitchens, manufacturing environments.

1.21 In Scope Electrical Equipment

As per Electrical Safety Act 2002 (s48B),

- (a) In-scope electrical equipment is low voltage electrical equipment that is designed, or marketed as suitable, for household, personal or similar use.
- (b) It is immaterial whether the low voltage electrical equipment is also designed or marketed to be used for commercial or industrial purposes.

1.22 Management Control (of plant and equipment)

In relation to plant and electrical equipment, management control includes having responsibility for the operation and use, testing and inspection, maintenance and repair of the electrical equipment. Control may also include responsibility for the safe installation and commissioning of the electrical equipment.

1.23 Person Conducting a Business or Undertaking (PCBU)

The University as a PCBU must fulfil its primary duty of care by ensuring, so far as reasonably practicable, the health and safety of its workers and of others at risk from the work the University carries out. This means anyone within the University who has management or control must ensure that work is conducted in a way that is electrically safe, and anything arising from a workplace, are without risks to ensure the health and safety of staff students, visitors or customers at the workplace.

A PCBU must ensure that:

- (a) Electrical equipment is electrically safe
- (b) Electrical safety of all persons and property by the electrical work performed by an outsourced contractor
- (c) People performing work on or near to exposed parts are electrically safe

1.24 Plant

Plant includes—

- (a) any machinery, equipment, appliance, container, implement and tool; and
- (b) any component of any of those things; and
- (c) anything fitted or connected to any of those things

1.25 Prescribed Electrical Equipment

As per the Electricity Regulation 2006, *Prescribed Electrical Equipment* means an item of electrical equipment stated schedule 4, column 1, as defined in the relevant standard.

Part 1- Equipment requiring registration and labelling

Part 2 - Equipment requiring registration only

Part 3 - Equipment requiring registration that may be labelled

1.26 Primary Duty of Care

The *Electrical Safety Act*, provides for circumstances (the electrical safety circumstances) in which a **primary duty of care** is imposed on the University to ensure the business or undertaking is conducted in a way that is electrically safe. [ES Act s30 (1)]

The duty includes ensuring:

- (a) all electrical equipment used in the conduct of the person's business or undertaking is electrically safe [Act s30(2)(a)]
- (b) in the performance of electrical work, the electrical safety of all persons and property likely to be affected by the electrical work [ES Act s30(2)(b)]
- (c) in the performance of work (whether or not electrical work) involving contact with, or being near to, exposed parts, persons performing the work are electrically safe [ES Act s30(2)(c)]
- (d) that persons who undertake electrical works are appropriately qualified and licenced [ES Act s57AA]

It is the **duty of an officer** of a PCBU to exercise **due diligence** to ensure the PCBU complies with its health and safety duties and obligations. [ES Act s38A] [WHS Act s27]

The **duty of workers** and **other persons** at a workplace include taking reasonable care of their own health and safety and that of others as well as taking reasonable care that his or her acts or omissions do not adversely affect other persons. Duties include complying with reasonable instructions given by the PCBU and cooperating with any reasonable health and safety policy or procedure at the workplace. [ES Act s39-s40] [WHS Act s28-s29]

1.27 Serious Electrical Incident

As per the *Electrical Safety Act 2002 (s11)* is an incident involving electrical equipment if, in the incident—

- (a) a person is killed by electricity, or
- (b) a person receives a shock or injury from electricity, and is treated for the shock or injury by or under the supervision of a doctor, or
- (c) a person receives a shock or injury from electricity at high voltage, whether or not the person is treated for the shock or injury by or under the supervision of a doctor.

1.28 Specified Electrical Equipment

- (a) for the performance of amusement work, manufacturing work or rural industry work, the following equipment (other than an amusement device or amusement ride)—
 - (i) a cord extension set with a current rating of not more than 20 amps;
 - (ii) an electrical portable outlet device with a current rating of not more than 20 amps;
 - (iii) electrical equipment, other than a portable safety switch, that—
 - (A) has a current rating of not more than 20 amps; and
 - (B) is connected by a flexible cord and plug to low voltage supply; and
- (b) for the performance of office work or service work—
 - (i) a cord extension set with a current rating of not more than 20 amps; or
 - (ii) an electrical portable outlet device with a current rating of not more than 20 amps; or
 - (iii) electrical equipment, other than a portable safety switch, that—
 - (A) has a current rating of not more than 20 amps; and
 - (B) is connected by a flexible cord and plug to low voltage supply; and
 - (C) is moved during its normal use for the purpose of its use.

2. PURPOSE

This procedure sets out the University's electrical safety requirements in order to protect people and property from the risks associated with electricity within the university workplace. It provides general processes in order to achieve those requirements.

Note: where there is a conflict in requirements set out in the procedure and the legislation or a code of practice¹, the higher standard of electrical safety shall apply.

In terms of electrical safety, where the Electrical Safety Act 2002 (ES Act) and the Work Health and Safety Act 2011 (WHS Act) both apply, the ES Act takes precedence. The University will also comply with subordinate legislation including the Electrical Safety Regulation 2013 and applicable Electrical Safety Codes of Practice in the management of electrical risks.

3. SCOPE

This procedure applies to all University Elements in the conduct of their business operations as well as workers² who in carrying out work (whether or not electrical work) for the University may come into contact with electricity and electrical equipment within the workplace including off campus activities and sites. The procedure also applies to other people who may be at risk from contact with electricity and electrical equipment within the University workplace including tenants of leased premises.

4. ROLES AND RESPONSIBILITIES

4.1 Delegated Authority

Heads of Elements, Directors and Research Centre Directors, are responsible for general and electrical safety in their own areas and the workplaces of their general and academic staff. Academic Heads of School, teaching staff, and all Managers including Campus Life Facilities Managers, are responsible for the identification, assessment and control of electrical risk exposure, to fulfil the requirements contained within this procedure.

4.2 Campus Life

Under the Construction Policy, Campus Life is responsible for the construction and maintenance of Griffith University buildings and structures including associated electrical infrastructure. Electrical infrastructure under Campus Life management control consists of electrical equipment, installations, plant, fittings and fixtures associated with a building or structure or the electrical supply to a building or structure.

As such Campus Life is responsible for ensuring that the electrical infrastructure under its management control is electrically safe and the way the electrical infrastructure is designed, installed, commissioned, maintained, used and operated is electrically safe.

This includes responsibility for ensuring that the electrical infrastructure is appropriately tested and maintained and associated records are available as required.

4.3 University Elements

All University elements are responsible for workplace and electrical safety of staff, students and other persons within their own areas as well as the electrical safety of electrical equipment in their management control. Control in relation to electrical equipment, includes having responsibility for the operation, use, maintenance and repair of the electrical equipment.

¹ From 1 July 2018 the status of codes of practice have been restored under legislation to require the safety measures in a code to be followed unless equal to or better than measures can be demonstrated

² Workers include employees, a contractor or subcontractor, employees of a contractor or subcontractor, employees of labour hire companies, outworkers, apprentices or trainees, work experience students and volunteers [WHS Act s7]

University elements are responsible for ensuring that electrical equipment used by employees or students are electrically safe and the workplace and electrical safety of all persons and property is not affected by the way the electrical equipment is designed, manufactured, installed, commissioned, maintained, used and operated. Unsafe electrical equipment is a risk to the electrical safety of staff, students and other persons and can cause electrical damage or reduce the reliability of electrical supply.

4.4 Staff, Students & Contractors

All staff, students and contractors are responsible for reporting of electrical hazards or damaged electrical equipment. This includes inspecting for, and immediately reporting, any physical damage to electrical cords and equipment.

5. GENERAL REQUIREMENTS

5.1 Management of Electrical Risks

University activities including the performance of teaching or research activities (whether or not electrical work) may expose a person to electrical hazards and the risk of death, shock or other injury caused directly or indirectly by electricity. These activities may involve the use of electrical equipment or the performance of work involving contact with, or being near to, exposed electrical parts.

Managers must ensure electrical hazards and risks are identified at a workplace in conjunction with workers and other relevant parties and that risk control measures to manage the electrical risks are implemented and maintained. Examples of electrical hazards include:

Electric shock arising from:

- contact with exposed live parts of electrical equipment or installations
- using faulty or damaged electrical equipment and cables
- using electrical equipment outdoors or in wet surroundings

Risk of fire or explosion arising from:

- inappropriate electrical equipment or installations being a source of ignition in hazardous atmospheres
- the overloading of circuits and/or overheating of equipment
- using heating equipment

Electrical hazards and risks are to be documented on the element operational Health and Safety risk register by applying the Griffith University risk assessment process.

When managing electrical risks, the risks must be eliminated so far as is reasonably practicable. Where it is not reasonably practicable to eliminate risks to health and safety the *hierarchy of control measures* must be considered in the establishment of control measures (or combination of the controls) for electrical and workplace safety risks.

5.2 Information, Training and Instructions

In the performance of work (whether or not electrical work) that involves an electrical risk to persons or property, Managers must ensure that persons (employees, students or other persons) involved in or may be affected by the work activities are provided with information, training and instruction which is suitable and adequate having regards to:

- the nature of the work carried out, and
- the nature of the risks associated with the work at the time, and
- the control measures implemented.

This includes the provision of training, Information and instruction about safe installation, operation and use of electrical equipment or an electrical installation to relevant workers or other persons.

Managers must ensure, so far as is reasonably practicable, that the information, training and instruction is provided in a way that is readily understandable by any person to whom it is provided.

5.3 Work carried out on or near energised electrical installations or services

Electrical work on energised electrical equipment is prohibited unless it is testing and fault-finding work. Refer to Section 10.

5.4 Electrical work only to be undertaken by licenced electrical worker or authorised person

Managers must ensure that persons performing electrical work are competent persons in relation to a task. Managers must ensure a person does not perform or supervise electrical work unless the person holds a current electrical contractor licence, electrical work licence or restricted electrical work licence, and the licence authorises the person to perform the work.

Workers - for workers to undertake electrical work at Griffith University, the person must:

- (a) Hold a current electrical licence under the *Electrical Safety Act 2002* (contractor, worker or restricted electrical licence), and
- (b) Be employed by Griffith University specifically to undertake the role as:
 - an electrician
 - an Electrical Engineer
 - Another trade or calling that requires limited / restricted electrical work to be undertaken in association with that trade or calling
 - Teaching/Research staff member or Technical Officer assisting the Teaching/Research Staff, and
- (c) Be trained in CPR and Switchboard Rescue requirements.
- (d) Be listed on the electrical worker register controlled by Campus Life

Note: Teaching, research and technical staff and/or persons holding a restricted electrical licence ARE NOT authorised to undertake electrical work on electrical infrastructure.

Contractors - for businesses contracting for the performance of electrical work, the business must:

- (a) Hold an electrical contractor, worker or restricted electrical licence, and
- (b) Be trained in CPR and Switchboard Rescue requirements
- (c) Be registered on the electrical worker register to undertake the electrical work.

Students - for students to perform electrical work:

- (a) It must be part of their Academic Course, and
- (b) Be under the supervision of Teaching Staff who have been deemed to be electrically competent by Griffith University.

5.4.1 Restricted Electrical Work Licence

A restricted electrical work licence DOES NOT authorise the holder of the licence to carry out electrical installation work. The work undertaken with a restricted electrical work licence is limited to specific electrical work associated with work from another trade:

- equipment in work area categories as detailed in the work area categories (e.g. refrigeration equipment).

5.4.2 Limited Unlicensed Tasks

A person is not required to hold an electrical work licence [ES ACT s 55(3)] for the purpose of performing and/or supervising the:

- (a) installing or repairing telecommunication cables
- (b) practicing the profession of an electrical engineer
- (c) remote rural installation work

- (d) testing of electrical equipment (as authorised to do so under s66 of the *Electrical Safety Regulation 2013*).

Authorised testing of electrical equipment (Test & Tag) - *UEENEEP026 Conduct In-service Safety Testing of electrical cord connected equipment*.

For (d) above, the following testing is authorised

- the testing of electrical equipment by **a competent person**, if the testing is required under:
 - part 6, division 6 (**Workplace electrical installations**); or
 - section 194 (**Hiring electrical equipment**);
- the testing of the works of an electricity entity by a competent person;
- the testing of electrical equipment by a person, other than testing mentioned in paragraph (a) or (b), if the testing does not interfere with the integrity of the electrical equipment.

Examples - a person testing a safety switch in a domestic electrical installation by operating a test button on the safety switch or a person using an appropriate voltmeter to measure voltage

- (e) apprentice of electrical work (in a calling required) or
- (f) performance as a trainee of electrical work (of type prescribed under a regulation)
- (g) performance, as a student, of electrical work as part of training under the supervision of teaching staff at a university; or a college, school or similar institution conducted or approved by a department of the State or of the Commonwealth.

5.5 Electrical Worker Register

The University has an obligation to maintain a register of licenced workers performing and/or supervising electrical work under the Electrical Safety Act [s57AB]. The register must include prescribed details for each holder of an electrical work licence engaged by the relevant person to perform or supervise electrical work.

Managers must ensure that workers and contractors, who are engaged by the university to undertake electrical work, are registered on the Electrical Worker Register. To register or notify of changes in registration details, an electrical worker form is provided on the Campus Life intranet – Electrical Safety. A Registered Electrical Worker must notify Campus Life in writing within 14 days of any changes in the status of their licence, personal details or employment.

6. GENERAL ELECTRICAL EQUIPMENT SAFETY

The University has a duty to ensure its work and equipment is electrically safe; by inspecting, testing and maintaining electrical equipment to ensure electrical safety is achieved.

6.1 Electrical Equipment Categories

Electrical equipment can be generally categorised in terms of transportability, such as:

Portable - an appliance which is hand-held and/or moved while in operation or can be moved easily from one place to another while connected by plug to a general-purpose outlet (connected to the supply).

e.g. vacuum cleaner, power drill, high pressure washers and concrete grinders

Movable - an appliance or equipment that can be moved readily from one place to another by unplugging from a general-purpose outlet, but that is not moved during operation.

e.g. AV projector, electronic balance scale, small water bath, hot plate and stirrers

Fixed/stationary/standing - an appliance or equipment:

- (i) **stationary** – equipment which in normal use is stationary in operation
e.g. desk top computer, bench top autoclave
- (ii) **standing** - a size or function as to be difficult or unlikely to be moved from one place to another (generally equipment with a mass exceeding 18kg)
e.g. fridge, freezer, furnace, stove, oven, office printer

- (iii) **fixed** - fastened to a support, secured in position or otherwise due to its size and mass, located in a specific location

e.g. furnace, laser, spectrometer, AC unit, chiller

6.2 Prior Approval for Installation of Particular Equipment

Under the Construction Policy, construction and building work comes under the responsibility of Campus Life. This includes responsibility for the installation and commissioning, operation and use, testing and inspection, maintenance and repair of electrical equipment or installations associated with buildings or structures.

Any proposed installation in a university premises by a group or element of fixed or stationary electrical equipment must be consulted with and approved by Campus Life where:

- It requires connection to wiring that forms part of the electrical installation and hence falls within the scope of AS/NZS 3000 (via a hard-wired connection), and/or
- It requires connection in hostile operating environments.

For fixed or stationary electrical equipment, this includes a proposed connection via 10 amp permanent hard wired power supply and both 15 amp and three phase power supplied by either a permanent hard wired power supply or via a supply cord into a socket-outlet.

This process is required to confirm the structure and electrical infrastructure has the capacity to contain, support and supply the equipment and to ensure the way the equipment is installed, operated and maintained does not affect the safety of people or the infrastructure.

6.3 Installation and Commissioning

A Group or Element proposing to install electrical equipment must ensure the equipment is installed, constructed and commissioned safely.

Groups may install and operate low risk portable, mobile and standing electrical equipment, where the equipment requires a 10 A power supply by a supply cord/device into a socket-outlet.

Approval for installation and/or connection of some fixed or stationary equipment is required from Campus Life prior to installation. Refer to Section 6.3 (Below).

The area responsible for installing electrical equipment must ensure:

- that the way the electrical equipment or installation is installed is electrically safe,
- appropriate installation processes are followed ensure that, when installed, it will be electrically safe, and
- it is tested and/or as a minimum examined after installation to ensure it is electrically safe.

6.4 Electrical Equipment Marking (Arc Flash)

Any of the following types of electrical equipment must be field marked with a **warning label** if subject to examination, adjustment, service or maintenance while energized –

- Switchboards.
- Panel boards.
- Industrial control panels.
- Meter socket enclosures.
- Motor control centers.



The following three elements shall be included on Arc Flash labels –

(a) At Least One of the Following:

- The available incident energy and the corresponding working distance.
- The minimum arc rating of work wear. Arc rated work wear indicates it has been tested for exposure to an electrical arc.

- The required level of work wear, that is, the arc rating of the work wear must correspond with the appropriate hazard level and incident energy present.
- The highest Hazard Risk Category for the equipment.

(b) At Nominal System Voltage

This identifies the voltage by which the electrical system is designated, to which certain operating characteristics are related and near the voltage level at which the system operates. Generally, it is about five to ten percent below the maximum system voltage for which system components are designed. Nominal system voltage is measured in volts.

(c) Arc Flash Boundary

The Arc Flash Boundary identifies systems of 50 volts and greater where the distance at which the incident energy level equals 1.2 cal/cm². This must be identified on a label because this incident energy distance can result in a second-degree burn if skin is unprotected.

6.5 Maintenance (Servicing and Repair)

A Group or Element with management control of electrical equipment or an electrical installation must ensure appropriate **repairs or services** ('*maintenance*') are undertaken on the equipment to ensure it is electrically safe.

Maintenance shall be undertaken in accordance with relevant legislation, Australian Standards and manufacturer's instructions.

The responsible manager must ensure the maintenance work is undertaken by competent persons authorised to undertake the work.

6.6 Inspecting and Testing

Regular inspecting and testing electrical equipment will help determine if is electrically safe.

6.6.1 Regular visual inspection

Regular visual inspection can identify obvious damage, wear or other conditions which might make electrical equipment unsafe. Many electrical defects are detectable by visual inspection for example, damaged cords. The nature and frequency of these inspections will vary depending on the nature of the work carried out in the workplace.

6.6.2 Testing and Tagging

Regular testing can detect electrical faults and deterioration that cannot be detected by visual inspection.

The responsible manager of the electrical equipment is required to ensure the testing and tagging of **specified electrical equipment** is undertaken in all cases.

Testing and tagging of specified electrical equipment is a mandatory safety measure to protect users where the cords, leads, portable outlet devices and electrical equipment are prone to damage or electrical faults as a result of its movement or portability or use in hostile operating environments.

Refer to the Griffith University Electrical Safety Procedure (Test and Tag).

6.6.3 Additional Testing

In addition to regular testing, electrical equipment and electrical installations must be tested:

- *Post Installation*

A person who *installs* electrical equipment or an electrical installation must ensure that it is tested and examined after installation to ensure it is electrically safe.

Note: Before placement in service, if sourced from a second-hand sale, to ensure the equipment is safe. AS/NZS 5761 shall apply.

- *Post Maintenance (Servicing and Repair)*

A person who *repairs or services* electrical equipment or an electrical installation must ensure that, it is tested and examined following repair to ensure it is electrically safe

Note: On return to service after a repair or servicing, that could have affected the electrical safety of the equipment. AS/NZS 5762 may apply;

- *Before Hiring/loaned out*

A person *hiring out electrical equipment* to other persons, must ensure each item of electrical equipment hired out is inspected and tested in accordance with the Electrical Safety Procedure (Test and Tag).

6.6.4 Electrical equipment with serious defect not to be connected to electricity source

If an item of electrical equipment has a serious defect, a licensed electrical worker must not connect the equipment to a source of electricity for use for its intended purpose.

6.6.5 Certificates of Testing

As soon as practicable after the connection of an electrical installation or making electrical equipment ready for connection, Electrical Workers must provide a certificate about the testing, complying with:

- *Certificate of Testing and Compliance* for *electrical installation* work issued in accordance with Section 227 of the Electrical Safety Regulation 2013.
- *Certificate of Testing and Safety* for work on *electrical equipment* issued in accordance with Section 26 of the Electrical Safety Regulation 2013.

Refer to *CLF-SAF-FRM-010 Certificate of Electrical Testing Compliance Form*.

The certificate (using the above form) is to be filled out and issued with the required information relating to the testing undertaken. This includes but is not limited to the test date and standards that the equipment was tested against.

6.7 Unsafe electrical equipment

If any electrical hazards or damaged electrical equipment are found, a report must be placed within *Facilities Assist* (<https://appclf.griffith.edu.au/facilities-assist>) or via the Maintenance Hotline (Ext 8888) on all campuses.

Where there is a *Dangerous Electrical Event* or *Serious Electrical Incident* involving *electrical equipment* (or an *electrical installation*), phone the Campus Facilities Manager or Maintenance Supervisor, immediately. Follow up by placing an incident or hazard report in GSafe.

Ensure that any unsafe electrical equipment at the workplace:

- (a) is disconnected, or isolated, from its electricity supply³, and
- (b) tagged "OUT Of SERVICE"; and
- (c) once disconnected or isolated:
 - (i) is not reconnected until it is repaired or tested and found to be safe; or
 - (ii) is replaced or permanently removed from use.
- (d) electrical equipment involved in a dangerous electrical event or serious electrical incident must be kept or inspection and/or regulator investigation.

³ Undertake only where safe to do so; notify Facilities Management where a competent person will be provided to assist

7. PROCUREMENT OF ELECTRICAL EQUIPMENT

The University may procure plant and electrical equipment by importing, purchasing or being gifted the plant and electrical equipment (e.g. to fit out laboratories, clinics and workshops). In most cases the group or element will retain ownership and therefore effective management control of the equipment.

7.1 New Equipment

In Australia, when the equipment is new, the supplier is deemed responsible for its initial electrical safety. New equipment need not be tested but shall be examined for obvious damage. Where deemed compliant the owner or responsible person shall ensure it is tagged "new to service" in accordance with 2.4.2.1 of AS/NZS 3670:2010.

Refer to the *Griffith University Electrical Safety Procedure (Test and Tag)*

7.2 Imported or Second-Hand Equipment (Gifted / Procured)

Much of this equipment will not come with a Regulatory Compliance Mark (RCM), a Certificate of Approval, certificate of conformity or other certificate stating compliance with relevant legislation or Australian Standard pertaining to the type of equipment.

7.2.1 General Requirements

In acquiring imported or second-hand (gifted / imported) equipment, the group or element must ensure:

- (a) the equipment is tested and examined by an approved testing entity or a suitably qualified person to ensure:
 - it is electrically safe, and
 - complies with relevant legislation and Australian Standards pertaining to the type of electrical equipment or appliance.
- (b) sufficient documentation is supplied or produced in relation to:
 - testing and examination (test report),
 - documented and/or registered design
 - instructions for the safe installation, operation and use

Note: Before placement in service, if sourced from a second-hand sale, to ensure the equipment is safe. AS/NZS 5761 shall apply.

7.2.2 Second-Hand Equipment (Gifted / Procured)

The safety of plant and electrical equipment which has been gifted or purchased second-hand by a group or element is the responsibility of the group or element.

The responsible Manager must validate with the provider or supplier (e.g. donator or seller) as part of the acquisition process that the electrical equipment is electrically safe, and sufficient documentation is supplied or produced in relation to the equipment.

7.2.3 Imported Electrical Equipment

If equipment is directly imported by the University and the equipment does not meet Australian Standards there is a risk that the equipment is unsafe.

Where plant or electrical equipment is imported for use by a group or element, as a minimum the obligations required of importers of plant [WHS ACT s24] and importers of electrical equipment [ES Act s33] will apply. For imported in-scope electrical equipment without a RCM (refer to Appendix A), the equipment must not be sold, hired or lent or accessible to the public.

8. DESIGN AND MANUFACTURE OF ELECTRICAL EQUIPMENT

Most electrical equipment procured by the University is supplied by a manufacturer or supplier. In the pursuit of technological advancement some schools or departments within the University may from time to time design and construct (assemble, make, modify or repair) electrical equipment.

Examples are Griffith Sciences, including:

- Griffith Technical Solutions (e.g. electronics and mechanical departments); and
- School of Engineering and Built Environment (e.g. electronics, electrical/ power, mechanical schools)

Campus Life may commission the design of an electrical installation associated with a building or structure or the electrical supply to these. Generally, the electrical equipment making up the electrical installation is proprietary manufactured equipment and the installation and commissioning of the equipment (including testing) is undertaken by contractors.

All persons responsible for design and manufacture of electrical equipment have a duty of care in respect to the electrical safety of the electrical equipment. This includes its safe installation, operation and use.

8.1 General Requirements

A group or element must ensure that for any electrical equipment that has been designed and/or manufactured by them, that:

8.1.1 Design

- (a) the electrical equipment or installation is designed to be electrically safe
- (b) the design is accompanied by information about the way the electrical equipment or installation must be used and installed to ensure the equipment or installation is electrically safe
- (c) the electrical equipment has a documented design

8.1.2 Manufacture

- (a) processes are in place and followed for the manufacture of the electrical equipment to ensure that:
 - (i) the electrical equipment, when made, will be electrically safe
 - (ii) the way the electrical equipment is made is completed safely (the work is done safely and competently)
 - (iii) the way the electrical equipment is tested is completed safely (If the electrical equipment is energised for testing, the person who performs the test must ensure persons not necessary for the testing are electrically safe)
- (b) the electrical equipment, when made, is tested and examined by an approved testing entity or a suitably qualified person to ensure:
 - (i) it is electrically safe
 - (ii) complies with relevant legislation and Australian Standards pertaining to the type of electrical equipment or appliance.

8.1.3 Testing of work

Testing of electrical equipment shall be in accordance with Section 25 of the Electrical Safety Regulation 2013 and relevant Australian Standards, including but not limited to:

- AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment
- AS/NZS 5762:2005 In-service safety inspection and testing – Repaired electrical equipment
- AS/NZS 3012 Electrical installations – Construction and demolition sites
- AS/NZS 3000:2018 Electrical installations (the Wiring Rules)
- AS/NZS 3017:2007 Electrical installations – Verification guidelines

A Certificate of Testing and Safety is to be issued for electrical equipment in accordance with the *Electrical Safety Regulation 2013* (s26). Similarly, for electrical Installations a Certificate of

Electrical Testing Compliance is to be issued in accordance with the *Electrical Safety Regulation 2013 (s227)*.

Refer to CLF-SAF-FRM-010 Certificate of Electrical Testing Compliance Form.

The certificate (using the above form) is to be filled out and issued with the required information relating to the testing undertaken. This includes but is not limited to the test date and standards that the equipment was tested against.

8.1.4 Record keeping

(a) Records of approvals and manuals shall be maintained by the manager of the university element for the life of the equipment or for at least five years, whichever is the greater. Certificates of testing and safety for work on electrical equipment will be maintained for at least five years.

(b) Risk assessments, permits, and Safe Work Method Statements (SWMS)

Depending on the source of the document:

(i) risk assessments may be uploaded to GSafe or Archibus

(ii) permits may be uploaded to Archibus or SharePoint

(iii) SWMS may be uploaded to Archibus, SharePoint or an internal management system (e.g. OneDrive).

9. ELECTRICAL WORK

9.1 General Safety Requirements of Low Voltage (LV) Electrical Work

(a) Electrical work is only to be undertaken by licenced electrical worker or authorised person. Refer to Section 5.4.

(b) Assume Live Until Proven Otherwise – ensure equipment is isolated and tested for de-energised. Refer to:

- CLF-SAF-SOP-008 Isolation, Lock-Out, Tag-Out Procedure
- CLF-SAF-SOP-009 Live Work, Fault Finding and Testing Procedure

(c) Safe systems of work are identified and implemented where required including:

- Risk assessments, permits, and Safe Work Method Statements (SWMS). To be maintained and reviewed (as required) by the manager or supervisor of the university element.
- Suitable and properly maintained and tested tools, testing equipment and PPE

(d) The area where the electrical work is to be carried must be set up so:

- Electrical cords, cables and equipment are protected from damage
- It is free from obstructions so as to allow for easy access and exit
- It protects other persons from unauthorised access or inadvertent exposure to risks including the maintenance of safe approach distances

(e) The electrical equipment or electrical installation is tested and examined following completion of the electrical work to ensure it is electrically safe.

9.2 Energised work prohibited

Electrical work on energised electrical equipment is prohibited unless it is testing and fault-finding work. Refer to CLF-SAF-SOP-009 - Live Work, Fault Finding and Testing Procedure.

9.3 General Safety Requirements of High Voltage (HV) Electrical Work

HV electrical work including installation, operation and maintenance of the high voltage installations is only to be undertaken by specialist HV electrical contractors engaged by Campus Life.

9.3.1 Working on or Near HV Installations and Substations

There are two types of situations where a worker may need to enter a HV installation or substation:

- (a) The worker needs to undertake non HV work / LV Work within a HV installation or substation.
- (b) A licensed electrician needs to undertake low voltage work within a HV installation or substation.

A permit is required (Authorising a Person) to access HV installation or substation. Refer to CLF-SAF-PER-009: HV Installation Access Permit. For HV Work the permit application must be accompanied by a Risk Assessment and Safe Work Method Statement prepared by the specialist contractor.

9.4 Isolation

Electrical workers performing electrical work including maintenance or service work on electrical equipment or other persons performing work or activities on or near energised equipment are required to have the equipment isolated, locked out and tagged out and tested for de-energised prior to undertaking the work. Refer to:

- CLF-SAF-SOP-008 Isolation, Lock-Out, Tag-Out Procedure
- CLF-SAF-PER-006 Services Isolation Permit
- CLF-SAF-SWMS-006 Isolation, Lock-Out Tag-Out SWMS

9.5 Test for De-energised

Before conducting electrical work on electrical equipment, a competent person must test to confirm whether the electrical equipment is de-energised. Refer to:

- CLF-SAF-SOP-009 Live Work, Fault Finding and Testing Procedure
- CLF-SAF-PER-008 Live Work, Fault Finding and Testing Permit
- CLF-SAF-SWMS-007 Live Work, Fault Finding and Testing SWMS

As a minimum, before conducting electrical work:

- (a) each exposed part is to be treated as energised until it is isolated and determined not to be energised, and
- (b) ensure that electrical equipment that has been de-energised cannot be inadvertently re-energised.

9.6 Electrical work under the supervision of teaching staff

Where a piece of equipment is designed, modified or constructed for educational purposes and/or is used as part of training students in electrical work under the supervision of teaching staff [ES Act s55 (3)(g)], the relevant teaching staff must:

- (a) perform a risk assessment (written or on GSafe) to ensure students, staff or the public, are free from electrical risk and are electrically safe.

The controls measures shall include but not be limited to:

- Prohibit performing any work on the electrical equipment while the equipment is energised (unless there is a specific and unavoidable reason that energised low voltage electrical work needs to be undertaken – refer to Section10)
- A visual inspection of the equipment,
- Continuity test to any exposed metal that is required to be earthed (in accordance with AS/NZS 3000),
- Insulation Test to ensure all live conductors are insulated from exposed metal,

- A method to ensure safe approach distances are maintained for staff, students and the public.
 - An isolation point or points that is clearly marked or labelled, easily accessible, and that can be operated quickly in case of an emergency.
 - The area where the electrical equipment is set up is clear of obstructions to allow for easy access and exit.
 - Testing in accordance with electrical test standards for the equipment e.g. AS/NZS 3760
- (b) prepare a Safe Work Method Statement (SWMS) detailing how the work will be undertaken including how the equipment will be proved de-energised prior to a person encroaching on the safe approach distance, and
- (c) ensure the piece of equipment where required is connected to either a type 1 or type 2 safety switch,
- (d) provide adequate information training and instruction to persons (employees, students or other persons) involved in or may be affected by the work activities. Refer to Section 5.2.

The direct supervisor of the work activity, and/or other competent persons including other supervisory or safety support personnel must formally review and agree to the implementation of the control measures pertaining to the work activity prior to the work activity being undertaken.

Records of written risk assessments and SWMS are to be retained for 28 days after the work to which it relates is completed. In the event of a serious electrical incident or dangerous electrical event occurring in connection with the work to which the assessment and SWMS relates, the manager / supervisor and Head of Department (HOD) of that university element must keep the assessment for at least 2 years after the incident occurs.

9.7 Personal Protective Clothing and Safety Equipment

Where electrical work is to be undertaken on or near exposed energized conductors or live conductive part, the minimum requirements for personal protective equipment is eye/face protection, protective clothing, protective footwear and hand protection such as insulating gloves/ flame-resistant gloves.

Accordingly, the type of personal protective equipment and tools used will be determined based on the Risk Assessment for the particular electrical equipment and the type of electrical work being performed. For low voltage work, AS/NZS 4836:2011 shall be considered as a basis of selecting appropriate personal protective equipment and tools. In particular:

- Section 5 Safety Equipment and Tools
- Section 7 Test Equipment
- Section 9 Personal Protective Equipment

The selection of PPE shall be guided by AS/NZS 4836:2011 - Table 9.2, while the selected PPE shall meet the minimum standards outlined in Table 9.1. Insulating covers and mats used for electrical safety purposes should comply with AS/NZS 2978 Insulating mats for electrical purposes. Insulated barriers should be of suitable material to effectively separate electrical workers from adjacent energised equipment.

Bracelets, rings, neck chains, exposed metal zips, watches and other conductive items shall not be worn while working on or near exposed energized conductors or live conductive parts. If worn, earplugs or earmuffs shall not be conductive.

Refer to:

- CLF-SAF-SOP-013 Personal Protective Equipment Procedure
- AS/NZS 4836:2011 Safe working on or near low-voltage electrical installations and equipment

9.8 Arc Flash (PPE)

The risk, of electric shock or arc blast and flash burn injuries, exists when performing fault finding or testing on or near exposed energised conductors. An arc flash or fault happens when electric current flows through air gaps between conductors – essentially, it is a short circuit. Arc flashes often occur when racking in a breaker, performing switching, Insulation failure, and accidents

caused by touching a test probe to the wrong surface or slipped (non-insulated) tools. In its most basic form, an arc is made up of four elements: Thermal Energy (heat), Acoustical Energy (sound), Pressure Wave and Debris. Each of these elements can cause serious injury or death to a person.

AS/NZS 4836:2011 specifies situations where Arc Flash PPE might be required.

Arc Flash PPE is required where an elevated risk of Arc Flash is identified during the risk assessment stage. Arc Flash PPE is required where electrical work is to be undertaken on a live or near exposed energized conductors or live conductive part carrying current exceeding 800A.

Refer to:

- CLF-SAF-SOP-013 Personal Protective Equipment Procedure
- CLF-SAF-GDE-011 Electric Arc Flash Protection Guideline
- AS/NZS 4836:2011 Safe working on or near low-voltage electrical installations and equipment
- AS/NZS 3000:2018 Electrical Installation (Wiring Rules)

10. ELECTRICAL WORK ON ENERGISED ELECTRICAL EQUIPMENT

10.1 Energised work prohibited

Electrical work on energised electrical equipment is prohibited unless it is testing and fault-finding work. Refer to CLF-SAF-SOP-009 Live Work, Fault Finding and Testing Procedure.

10.2 Procedure for Testing and Fault Finding

De-energised testing methods should be used before energised testing methods.

Fault finding should first be attempted in a de-energised environment using de-energised testing methods. If unsuccessful, energised testing methods may be used subject to meeting the requirements of the WHS Regulations and this Code for working energised.

Requirements for undertaking energised testing and fault finding are contained in:

- CLF-SAF-SOP-009 Live Work, Fault Finding and Testing Procedure
- CLF-SAF-SOP-010 Working in Vicinity of Overhead Lines or Underground Cables Procedure, and
- CLF-SAF-SOP-012 Electrical Test Instrument and Safety Equipment Maintenance Procedure

The attention of worker/s is particularly drawn to the requirements contained in the above procedures for:

- Undertaking a risk assessment,
- Preventing inadvertent contact with an exposed energised part,
- Using suitable and properly maintained and tested tools, testing equipment and PPE,
- Using a safety observer if required by risk assessment conducted for the work, and
- Working in accordance with a suitable SWMS.

In all cases when working on or near energised electrical installations or equipment a risk assessment must be conducted, and a safe work method statement prepared in consultation with the workers, students and other persons involved in the work activity which has been risk assessed.

Authorisation is required where an elevated risk is identified during the risk assessment stage e.g. over 800 A. The direct supervisor of the work activity, and/or other competent persons including other supervisory or safety support personnel must formally review and agree (sign off) to the implementation of the control measures pertaining to the work activity prior to the work activity being undertaken.

Information, training and instruction shall be provided to all employees, students or other persons that may be involved in or affected by the work activities. Refer to Section 5.2.

Appropriate PPE shall be worn for any energised electrical work. Metallic jewellery shall not be worn while working on or near energised electrical equipment. Refer to Section 9.7 and 9.8.

11. POWER OUTLETS AND SAFETY SWITCHES

11.1 General power outlets

All general power outlets (GPOs) installed in Griffith University facilities are marked with a circuit identification number on the front plate of the power outlet. If a power outlet is not marked or the circuit number indicator has been removed or damaged, seek assistance from Campus Life Facilities Management.

In all cases consideration of the required power supply for electrical equipment should be in accordance with the electrical equipment manufacturer's requirements.

Where several items of electrical equipment are to be connected to GPOs on the same circuit (denoted by the identification number on the GPO), the risk assessment must consider the electrical equipment that may be required to operate concurrently, and controls implemented to minimise the risk of overloading the power circuit.

11.2 Safety Switches (or Residual Current Devices)

Most parts of the University are protected by fixed safety switches (or Residual Current Devices). RCDs are not recognized as a sole means of basic protection in normal service. RCDs are designed to provide additional protection against the effects of electric shock by automatically disconnecting supply before serious physical injury can occur.

There are two types of RCD, Type II RCD (general protection) and Type I RCD (required within patient area).

Safety switches are classified in AS/NZS 3190 Approval and test specification – Residual current devices (current-operated earth-leakage devices). Safety switch testing is to comply with AS/NZS 3760 (In-service safety inspection and testing of electrical equipment).

Safety switch testing within patient area must be done by a specialised testing contractor to comply with relevant version of AS/NZS 3003.

11.2.1 Non-Portable (or 'Fixed') RCDS

Non-portable (or 'fixed') RCDs are RCDs that are installed at either the switchboard (see Figure 1) or a fixed socket outlet (see Figure 2).

Figure 1 Switchboard safety switch



Non-portable safety switches installed at the main switchboard protect the wiring connected to the safety switch and electrical equipment plugged into the protected circuit.

Figure 2 Fixed socket outlet safety switch



Non-portable safety switches installed at a fixed socket outlet provide protection to electrical equipment plugged into the outlet

11.2.2 Portable RCDS

Portable RCDs are generally plugged into a socket outlet and, depending on design, may protect one or more items of electrical equipment.

Figure 3 Portable safety switch fitted directly to power cable



Figure 4 Portable safety switch protected power board



11.3 Double adaptors and piggyback plugs

Double adaptors and piggyback plugs are not permitted for general use within any University buildings, including Residential Colleges. Overloading socket outlets and associated circuits by using double adaptors and piggyback plugs can cause overheating and fires as well as damage to electrical installations and equipment.

Piggyback plugs may only be used by exception for Entertainment, Theatrical and Stage Equipment work under the conditions set out under Section 12.7.

11.4 Multi-outlet power boards

With due consideration to the age of some of the buildings, the University's long-term objective is to provide the appropriate numbers of fixed general power outlets within buildings, removing the need to use multi-outlet power boards in most working environments. This approach will incur considerable capital cost.

In the interim, the University intends to minimise the electrical risk of overloading socket outlets and circuits which can cause overheating and fires as well as damage to electrical installations and equipment, by implementing the following approach to the use of multi-outlet power boards:

The use of multi-outlet power boards is permitted where the Element can demonstrate:

- It has performed a risk assessment and implemented suitable controls to ensure property and persons are electrically safe.
- It has taken steps to ascertain the number of fixed general power outlets required and to establish an implementation plan.

Where multi-outlet power boards are permitted the following conditions must be achieved:

- The multi-outlet power board is purchased by the University
- All the power points on the multi-outlet power board are individually switched
- The multi-outlet power board has an in-built load limiting switch with a maximum rating of 10A
- They must not be used to supply high current consumption devices.
- Multi-outlet power boards must not be daisy chained.
- Multi-outlet power boards must not be used in hostile environments or exposed to wet or moisture laden atmospheres.
- The multi-outlet power board has been tested and tagged⁴
- Be connected to a type 1 safety switch or type 2 safety switch

11.5 Construction, Demolition and Maintenance

Domestic type multi-outlet power boards must not be used for conducting construction work (including maintenance) or manufacturing work. The use of multi-outlet power boards will be

⁴ New multi-outlet power boards / electrical equipment need not to be tested but shall be examined for obvious damage and for prior to being put into service. Where deemed compliant, a new to service tag shall be applied that includes the following information: (as required by AS/NZS 3760 section 2.4.2.1 (c)). Refer to Electrical Safety Procedure Test and Tag New equipment ("New to Service Tag")

permitted for construction and maintenance works subject to compliance with the following conditions:

- Power from the multi-outlet power board is only used within the designated construction zone
- All the power points on the multi-outlet power board are individually switched
- The multi-outlet power board has been tested and tagged, and
- The multi-outlet power board and/or the power lead servicing the multi-outlet power board must be fitted with a portable Safety Switch compliant and tested in accordance with AS/NZS 3760.
- Portable outlet devices must incorporate overlaid and earth leakage protection and comply with AS3105.

11.5.1 Portable Socket Outlet Assemblies (PSOA)

Portable Socket Outlet Assemblies (PSOA) must:

- comply with AS/NZS 3190 and be of class H (should be marked with these requirements)
- have an overload protective device, RCD and plugs intended for connection of low-voltage socket-outlet
- flexible cable feeding the PSOA must be the heavy-duty sheathed type not longer than two metres.

11.5.2 Auxiliary socket outlet Panel (ASOP)

Auxiliary socket outlet Panel (ASOP) must:

- must be of robust construction to withstand mechanical damage and have a minimum IP23 rating
- located at a height of 1.2 to two metres above the floor level and be securely mounted to a fixed structure or a structure designed for that purpose
- supplied by an RCD protected circuit at the switchboard it originates from
- provided by a clearly marked 'isolating switch' that controls the incoming supply. Incoming supply cable must have a minimum cross-sectional area of 4mm²
- provided by means to relieve strain on plug and socket outlets of flexible cables.

Figure 5 Portable Socket Outlet Assemblies (PSOA)



Figure 6 Auxiliary socket outlet Panel (ASOP)



12. SPECIFIC SITUATIONS AND RESPONSIBILITIES

12.1 Personal Electrical Equipment

Where staff or students bring personal electrical equipment including domestic or other appliances into the workplace, (whether or not it is for university purposes) the relevant manager must ensure it is tested and tagged prior to use at the workplace.

It is at the discretion of the responsible manager as to whether the personal electrical equipment is approved for use in the workplace (including residential accommodation), due to either the cost of testing and tagging the personal electrical equipment or other reasonable operational or safety factors. In all cases, if the equipment does not carry a RCM (Regulatory Compliance Mark, Appendix A), the equipment is not authorised to be used in the university workplace.

12.2 Portable bar or fan heaters

Portable bar or fan heaters are not permitted.

12.3 Electrical equipment used in research/projects/artworks

When electrical equipment is used in research/projects/artworks etc. the relevant academic supervisor must ensure it is tested and tagged before use, and, if the equipment has been purchased from an overseas vendor, that the equipment is not used unless it is tested as safe.

12.4 Meeting room equipment

Meeting room equipment that belongs to Schools or Elements is their responsibility.

12.5 Allocated Equipment

The testing and tagging of equipment owned by Digital Solutions (e.g. Audio Visual) or Campus Life (e.g. dehumidifiers) and allocated for use by an element in teaching and research laboratories is the responsibility of these elements.

12.6 Off-campus activities

For off-campus activities, the relevant organising element is responsible for identifying any potential electrical safety hazards pertaining to such activities including testing and tagging of electrical equipment and provision and testing of portable safety switches, as required and must be captured in the field trip risk assessment.

If the electrical equipment being used for off-campus activities has been designed and constructed by Griffith University Science Workshop, then written approval must be obtained from the Head of School, before such equipment is permitted to leave the campus.

12.7 Entertainment/Theatrical/Stage Equipment

All electrical equipment exceeding 20 amps, as used in theatres and cinemas, must be tested and tagged by a fully-licensed electrician every 6 months.

The use of double adaptors is prohibited. Piggy back plugs may ONLY be used in conjunction with lighting dimmer panels.

Re-usable three pin piggyback plugs must not be used. The use of moulded or clear, riveted (not user accessible) piggyback plugs is acceptable only when wired by competent, appropriately trained, certificated and authorised personnel.



Piggyback plugs used with lighting dimmers

Where a non-portable (or 'fixed') safety switches have not been installed at either the switchboard or a fixed socket outlet - all lighting panels / dimmers must have RCD protection. Maximum loads of lighting dimmers shall not be exceeded to avoid overloading and a fire hazard.

Lighting equipment likely to reach high temperature must be suitably guarded with a clearance maintained from flexible cords to prevent overheating and melting.

Lighting designers or persons designing a temporary lighting system require knowledge and understanding for the capacity of the available power supply. In designing a system and the

layout of equipment, the capacity of cabling should also be considered. Dimmer and phase loading plus size of lighting equipment should be carefully planned with a load diagram for the system.

12.8 Sensitive or critical items of equipment

The connection of more than one sensitive or critical item of equipment to power outlets supplied from the same circuit must be considered in the risk assessment process. A trip of a circuit supplying power to several items of sensitive or critical equipment could exacerbate losses to the business.

The assessment of power outlet requirements should consider:

- Sensitive analytical, measuring or monitoring equipment may need to be served from a separate power circuit to the space in which they are installed.
- Sensitive equipment which requires good power quality may need to be supplied with a power quality device such as a Voltage Stabiliser and Surge Protection.
- Critical equipment may need additional power quality devices such as Uninterrupted Power Supply (UPS) or emergency generator power supply.

Any such specific requirements must be discussed and agreed with Campus Life.

12.9 Medical equipment

A higher standard of testing applies for medical equipment under AS/NZS 3551:2012 management programs for medical devices. This includes the following tests:

- Visual inspection of external mains supply components
- Protective Earthing Resistance Test
- Insulation Resistance Test
- Touch Current Test
- Earth Leakage Current Test
- Patient Leakage Current Test
- Mains Contact Current Test

Accordingly, a person who test and tags this particular equipment must show competence in AS/NZS 3551. Other applicable standards include but are not limited to:

- AS/NZS 4513 -1995 Medical Electrical Equipment - Fundamental aspects of safety standards
- AS/NZS IEC 60601.1:2015 Medical Electrical Equipment - General Requirements for Basic Safety and Essential Performance

12.10 Standing equipment drawing continuous current

When refrigerators, freezers, incubators and ovens etc., are connected to the supply, they must:

- Be in good condition (ensure plug and cord are also in good condition), and
- If not purpose built and installed, be placed in accordance with the manufactures installation requirements, and if these requirements are less than 150mm clearance then the GU default standard is 150mm clearance from any surface (including other standing equipment), and
- Be plugged directly into a power point socket (not a multi-power board) with a cord that is not coiled.

12.11 Microwave Ovens

When microwaves are connected to the supply, they must:

- Be in good condition (ensure plug and cord are also in good condition), and
- Be plugged directly into a power point socket (not a multi-power board) with a cord that is not coiled.

12.12 Lending/Hire of Equipment

A hire situation is created when the hirer provides electrical equipment, to a person or entity external to the hirer's organization, which passes out of the control of the hirer. This excludes equipment that is being lent to Griffith University students/staff.

Refer to Griffith University Electrical Safety Procedure (Test and Tag).

13. ELECTRICAL TEST INSTRUMENTS

Workers shall use only test instruments, safety equipment and PPE which has been tested and is within due test date.

Refer to CLF-SAF-SOP-012 Electrical Test Instrument and Safety Equipment Maintenance Procedure

All equipment used for the testing of electrical circuits including voltage, polarity, insulation and earth resistance and other prescribed electrical testing requirements will be calibrated to meet manufacturers and Australian Standards calibration requirements. This equipment will be listed on an Electrical Test Equipment Calibration Register in each Element.

The Electrical Test Equipment Calibration Register will be kept for a minimum of five years for historical and internal auditing purposes.

14. INCIDENT NOTIFICATION AND REPORTING

Electric shocks often result from people making contact with unprotected energised parts of electrical equipment and earth. Contact with energised parts may occur by touching:

- bare conductors
- internal parts of electrical equipment
- external parts of electrical equipment that have become energised because of an internal fault
- metallic or other conductive equipment that has inadvertently become live.

Contact with earth occurs through normal body contact with the ground or earthed metal parts.

14.1 Medical Attention

Any person receiving an electric shock or involved in an electrical incident contributing to an injury must seek medical attention immediately. Care shall be taken to ensure that other personnel are not exposed to potential hazards.

NOTE: The full effects of an electric shock or an electrical incident might not be immediately obvious, but symptoms may materialize later.

14.2 Reporting

Any electric shocks or "tingles" from electrical equipment or electrical infrastructure (wiring, switches or plugs) or any minor damage caused by electricity (smouldering, fire etc.) must be reported immediately to the Campus Life Maintenance Hotline Ext 8888 on all campuses and entered into GSafe.

Damaged or defective electrical equipment is to be reported to the Maintenance Hotline Ext 88888 and/or via the Facilities Assist Application (<https://appclf.griffith.edu.au/facilities-assist>).

All electrical hazards and incidents including notifiable incidents to the Electrical Safety Office (e.g. serious electrical incidents and dangerous electrical events) must be reported in

accordance with the Griffith University *Reporting and Recording Procedure for incidents, injuries, dangerous incidents, hazards and near misses*.

15. REVIEW OF ELECTRICAL SAFETY COMPLIANCE

Campus Life will develop an internal audit review schedule, which will sample the level of compliance to this procedure. The representative sample will consider risk exposure and any historical electrical events that exposed staff or students to electrical risks. In consultation with the Elements, the audit sample will be designed to provide evidence to the Vice President (Corporate Services) and other element stakeholders, of electrical safety compliance across all Griffith University workplaces.

APPENDIX A

GUIDE TO LABELLING AND COMPLIANCE MARKINGS

There is no requirement for an RCM mark for electrical equipment that is not in-scope (i.e. outside the scope of the definition - for example equipment that is not for household, personal or similar use). In-scope electrical equipment is required to display a RCM.

In-scope electrical equipment is low voltage electrical equipment that is designed, or marketed as suitable, for household, personal or similar use, immaterial if it is also to be used for commercial or industrial purposes. [ES Act 48B]

However, all electrical equipment manufactured, imported and sold must be electrically safe, and generally would be required to show compliance with “AS/NZS3820 Essential safety requirements for electrical equipment.” This standard in itself is not a test standard and references/relies on compliance to relevant product specific safety standards. Compliance with AS/NZS3820 is achieved when a product complies with the relevant Australian product safety standard.

A) Regulatory Compliance Mark (RCM)

A person must not sell an item of a type of level 1, 2 or 3 of in-scope electrical equipment unless the item is marked with the RCM in compliance with the defining standard and the relevant type was registered in relation to a registered responsible supplier.

In some cases the RCM mark is on the item’s labelling or packaging in compliance with the defining standard.



B) C-Tick and A-Tick Markings

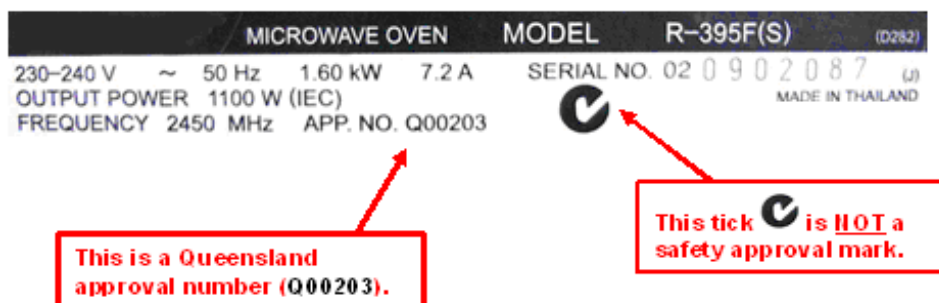
Compliance markings for EMC/Radio communications equipment (C-Tick) and telecommunications equipment (A-Tick) were consolidated into the RCM as of March 2013.

Commercial equipment may require registration by the Australian Communication and Media Authority (ACMA) which is unrelated to electrical safety requirements. The new labelling and registration arrangement for the RCM does not change the device compliance requirements of the relevant regulatory arrangements. Testing, record-keeping and evidential requirements will continue to be set out in the relevant labelling notices.

C) Previous Electrical Appliance Approval Markings

Holders of Certificates of Approval under the old scheme were granted authorisation to mark the equipment with a unique approval number, or the RCM. These unique approval numbering systems are an indication the product has been through the certification process, equivalent to the requirements for level 3 in-scope electrical equipment.

Typically, these markings consist of a letter to indicate the state or territory jurisdiction in which approval was granted, followed by several characters, e.g. Q<number>; NSW<number>



The Queensland approval marks and other states and territories approval marks of certificates that have not expired or been cancelled will be recognised by Queensland until 1 March 2018 after which time the equipment must be marked with the RCM.

D) Energy Efficiency Labelling

Energy rating labelling is unrelated to electrical safety requirements. An energy rating label IS NOT an Electrical Safety Compliance marking or label.

Energy rating labelling often works hand-in-hand with Minimum Energy Performance Standards (minimum standards). Minimum standards establish a minimum level of energy performance that products must meet before they can be sold to consumers. Minimum standards improve the average efficiency of products available on the market by raising the performance of the least efficient products.

The Electricity Regulation 2006 (Qld) sets out requirements for items of Prescribed Electrical Equipment to be tested and comply with minimum energy efficiency and performance criteria for the item in the relevant standard. The item must be registered and, in some cases, labelled. Prescribed Electrical Equipment means an item of electrical equipment stated is schedule 4, column 1, as defined in the relevant standard.

