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1 PURPOSE

The University is required by law to provide a safe working environment for all UWA personnel and all contractors engaged by UWA. Equally, all UWA personnel and contractors are obliged by law to conduct themselves and their work in a safe manner. The purpose of this procedure is to inform all levels of UWA management and all individuals of their obligation to –

- *Comply with the law and the particular requirements covering electrical safety; and*
- *enable them to actively assist in achieving electrical safety at UWA*

The requirements detailed in this Procedure apply to all persons (staff, contractors, students, visitors) who carry out electrical activities at or for the University. This includes those who undertake research or a programme of study at the University including undergraduate, postgraduate studies and collaboration with outside agencies.

2 OVERVIEW

Electricity is a critical utility service in today's business environment and is immensely useful, but it can be hazardous to persons and property if not carefully controlled and managed. Over the years many national technical and safety standards have been developed to assist the safe control and use of electricity and many of these technical standards are referenced (that is, applied and enforced) by legislation.

The following provides an overview of the principal components of the technical and safety regulatory framework relevant to UWA electrical facilities and equipment, and related electrical work activities.

WA general workplace safety legislation administered by the regulator WorkSafe WA:

- *Occupational Safety and Health Act 1984*
- *Occupational Safety and Health Regulations 1996*

WA electrical legislation administered by the regulator EnergySafety WA:

- *Electricity Act 1945*
- *Electricity (Licensing) Regulations 1991*
- *Electricity Regulations 1947*

In summary, the requirements of WA legislation are applicable to academic personnel (e.g. lecturers and researchers), students of various levels, personnel that support academic activities (e.g. technicians), contractors (and their personnel) engaged by UWA and Campus Management personnel in respect of electrical activities which they carry out as part of –

- *laboratory activities and/or research work;*
- *the design, assembly/construction or manufacture of electrical equipment for laboratory and/or research work;*
- *the purchase and/or modification or repair of electrical equipment for office, laboratory and/or research work;*
- *HV and LV electrical installation switching (that is, operational work);*
- *HV and LV electrical installing (that is, fixed wiring) work;*
- *ELV, communications and information systems cabling work; and*
- *Inspection, audit and certification work.*

Note:

HV refers to a voltage > 1000 volts ac or 1500 volts dc

LV refers to a voltage exceeding ELV but less than HV

ELV refers to a voltage < 50 volts ac or 120 volts ripple free dc; and

The Government of Western Australia is considering the adoption of proposed changes to health and safety laws. The proposal is based on a federally produced model which is intended to “harmonise” health and safety law across all Australian states and territories. Most states have already adopted the harmonised “Work Health and Safety Act” whereas Western Australia currently has a draft version under consideration. This “green bill” was announced during October 2014 to be followed by a three month period of consultation. The core provisions are based on the harmonised model but some aspects have been modified.

The next section provides an overview of the statutory requirements contained in the listed existing legislation, to the extent considered particularly relevant to electrical safety at UWA.

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3 KEY STATUTORY REQUIREMENTS

3.1 Occupational health and safety legislation (enforced by WorkSafe WA)

In brief, the **Occupational Safety and Health Act 1984** specifies the following fundamental, generic requirements:

- A) An employer shall provide and maintain a working environment in which the employees are not exposed to hazards and in particular, an employer shall —
- provide such information, instruction, and training to, and supervision of, the employees as is necessary to enable them to perform their work in such a manner that they are not exposed to hazards; and
 - where it is not practicable to avoid the presence of hazards at the workplace, provide the employees with adequate personal protective clothing and equipment to protect them against those hazards

- B) An employee shall take reasonable care —
- to ensure his or her own health and safety at work; and
 - to avoid adversely affecting the safety or health of any other person through any act or omission at work

An employee commits a breach of these requirements if the employee —

- fails to comply, so far as the employee is reasonably able, with instructions given by the employee's employer for the safety or health of the employee or for the safety or health of other persons; or
- fails to use such protective clothing and equipment as is provided, or provided for, by his or her employer in a manner in which he or she has been properly instructed to use it; or
- misuses or damages any equipment provided in the interests of safety or health; or
- fails to report forthwith to the employee's employer —
 - i. any situation at the workplace that the employee has reason to believe could constitute a hazard to any person that the employee cannot correct; or
 - ii. any injury or harm to health of which he or she is aware that arises in the course of, or in connection with, his or her work.

- C) An employee shall cooperate with the employee's employer in the carrying out by the employer of the obligations imposed on the employer under this Act.

The **Occupational Safety and Health Regulations 1996** principally specify detailed requirements for risky or potentially hazardous work activities or hazardous situations, to ensure an adequate level of safety for workers and other persons in the vicinity of the work being performed.

For example, the regulations specify certain safe work practices requirements for work in confined spaces, or for demolition work, or work involving asbestos products. There are many references to Australian Standards within the regulations, as a means of specifying acceptable benchmarks for potentially hazardous or risky work. For example, the manufacture of cranes is required to comply with relevant Australian Standards, and these include the electrical requirements for cranes.

Generally however these regulations do not specify detailed requirements for the technical standards of electrical activities and equipment, as this is left to regulations under the *Electricity Act 1945*. There are three exceptions set out in Division 6 - Electricity:

- (i) Regulation 3.59 requires the use of moulded (one part type) or transparent sockets/plugs when replacing LV damaged cords and plugs/sockets.
- (ii) Regulation 3.60 requires that normally hand-held, portable electrical equipment is to be connected to LV supply via permanently installed RCDs (residual current devices, also known as "safety switches", which switch off when current leakage to earth exceeds a safe level), either at the socket outlet or at the switchboard. The regulation also requires that where persons are not satisfied that fixed RCDs have been installed then portable RCDs are to be used for connecting normally hand-held, portable electrical equipment at workplaces.

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- (iii) Regulations 3.61, 3.62 & 3.63 deal with the use of electricity on construction and demolition sites, of which WorkSafe is the principal safety regulator. The principal requirements are that temporary electricity supplies and their use on such sites shall comply with AS/NZS 3012 and that portable electrical equipment and portable RCDs shall be tested and then tagged in accordance with the standard plus the specific requirements of regulation 3.62.

The **WorkSafe WA; Guide to testing and tagging portable electrical equipment and residual current devices at workplaces; April 2014**, treats construction and demolition sites separately to other workplaces such as UWA work areas. This guidance has been used to develop the strategy, contained in this document, for defining types of electrical environment based on the risk of damage occurring whilst in use.

3.2 Electrical safety legislation (enforced by EnergySafety WA)

The regulations under the Electricity Act 1945 (WA) that are relevant to UWA are the following:

Electricity (Licensing) Regulations 1991

These regulations deal with electrical safety on consumers' electrical installations, which may be commercial, industrial, institutional or residential. The regulations cover three areas:

3.2.1 Licensing requirements

The fundamental requirement is that work on electrical equipment, facilities and installations operating at LV or higher may only be carried out by persons with a relevant licence, unless an exemption exists for a particular situation.

This means the carrying out of electrical installing work (the installation of the fixed wiring, switchboards and connecting of mechanical plant etc.) may only be carried out by **licensed electricians**. Today's electricians are also legally able to perform electrical fitting work (e.g. electrical machines assembly and repair, switchboard construction etc.).

In the majority of cases, electrical construction work involving the establishing of an electrical installation on industrial, commercial, institutional or residential premises is carried out by **licensed electrical contractors** employing licensed electricians. The regulations require electrical contractors to be licensed. The regulations also require electrical contractors to accept responsibility for quality control and certification of compliance of the electrical work carried out at a consumer's installation (this certification links into the inspection process covered by the *Electricity Regulations 1947* and overseen by EnergySafety).

In the case of major industrial, commercial or institutional premises, as an alternative to using electrical contractors, the owner of the business on the premises may employ electricians to carry out electrical installing work as required and also maintenance work. In those cases an **In-House Electrical Installing licence** is required to be held by the employer and a different but similar certification process applies.

In WA electrical **apprentices** are required to be licensed to carry out electrical work, while undergoing training.

Migrants who are electricians in their country of origin may apply to obtain **electrical permits** to work under the supervision of an electrician until they are able to pass assessment for an electrician licence.

Restricted electrical licences may be issued to tradespersons who require to perform limited electrical work as part of their principal occupation, such as refrigeration - air conditioning tradespersons, and to those only carrying out disconnection and reconnection from fixed 415/240V wiring of electrical equipment (e.g. mechanical fitter replacing an electric motor with a similar unit, or plumber replacing an electric hot water unit). The person's licence stipulates the scope of work permitted.

In WA electrical **line workers** and **cable jointers** are not required to be licensed but must have been formally trained by a recognised body such as a major electricity utility or a registered training organisation.

A licensing exemption also exists for limited scope electrical work on appliances (which by definition consume or convert energy) intended to be connected to electricity by a **LV flexible cord/cable and plug, single or 3 phase**. This exemption covers the affixing of a plug, electrical appliance plug or cord extension socket to a flexible cord (or cable) used for connecting electrical appliances, portable sub-distribution board or residual current device to a LV plug socket outlet; as well as the **testing** and **servicing** of these articles.

Servicing of these articles means:-

- Identifying a faulty component in the article and replacing it with a component having an equal or substantially similar engineering specification; or
- Affixing a flexible cord/cable to the article.

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Note that the *Occupational Safety and Health* legislation requires UWA to ensure the person to have received suitable training and has relevant instruments to check the cord fitting and servicing work.

In late 2014 EnergySafety's Electrical Licensing Board approved in principle the issuing on application of special electrical worker permits to UWA technical personnel (referred to as "technicians") so they may assemble (and repair/modify), test and inspect LV powered electrical equipment intended to be used in UWA laboratories and research facilities, subject to these persons having completed the following:

- An Electrical Cord and Plug course at a Registered Training Organisation; and
- A Portable Appliance Testing (PAT) course at a Registered Training Organisation; and
- The UWA in-house course titled "Electrical Equipment and Appliances at UWA: Designing, assembling and inspecting for electrical safety" (this course is intended to run in April 2015).

These special permits, formally referred to as **University Technician Electrical Worker Permits**, allow unrestricted electrical work on LV electrical equipment for laboratory and research purposes, unlike the limited scope exemption for the fitting/repair of LV cords/plugs and the servicing of appliances referred to above. Details of application requirements for these **special permits** (as they are referred to in the remainder of this Procedure) as well as other electrical licences are available at the EnergySafety website.

Note: A new national occupational licensing system to be administered by NOLA (National Occupational Licensing Authority) was expected to come into effect in late 2014, as part of national reforms initiated by the Council Of Australian Governments (COAG) but this was discontinued in late 2013. The existing WA electrical licensing categories will remain, as they are already nationally harmonised to a large extent. Furthermore, EnergySafety WA will continue to administer the licensing framework in WA.

3.2.2 Technical standards for electrical work

These regulations set out the minimum technical standards for all types of consumers' installations (commercial, industrial, institutional and residential), both at HV and at LV.

The general standards are AS 2067 for HV installations and AS/NZS 3000 (the "Wiring Rules") for LV installations and numerous other standards are prescribed for particular types of electrical installations (e.g. in explosive atmospheres, patient treatment areas, transportable structures and vehicles) in Schedule 2 of the regulations, and these must be complied with, where relevant.

In summary, persons designing electrical installations and persons constructing, maintaining and repairing electrical installations operating at LV or higher must comply with these prescribed standards.

Note that there are formal obligations in the regulations requiring persons to perform all types of electrical activities, including work on electrical equipment, safely and to a safe standard (regulation 49B):

To the extent practicable and reasonable, a person is to ensure that when electrical work has been carried out by him or her —

- a) the thing on which the work was performed is safe to use; and*
- b) the work has been completed to a trade finish*

and failure to comply is a breach of the regulations, regardless as to whether or not the person holds a licence or permit.

3.2.3 Work practices safety

The regulations also deal with the safety of apprentice electricians by specifying supervision requirements and other procedural matters such as accident reporting.

It should also be noted that the Director of EnergySafety issued in 2008 a formal guideline under the *Electricity Act 1945*, effectively **banning all live LV electrical work** (other than fault finding, testing etc.) unless the risk to life could be shown to be greater if electricity is switched off while work on parts of the electrical installation takes place.

This directive is fully supported by the requirements of Safe Work Australia's Code **Managing Electrical Risks in the Workplace**. If work on live parts is to take place, very special precautions apply.

In summary, all electrical manual work practices and electrical operational practices (switching and permit issuing) by UWA personnel and contractors shall comply with this Code, which also references AS/NZS 4836 – Safe working on low voltage electrical installations to provide guidance for safe electrical work practices, including operational work.

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3.2.4 Electricity Regulations 1947

These regulations cover:

- a) Energy efficiency labelling requirements – this is about the Star Rating labelling system for electrical appliances.
- b) Minimum energy performance standards – this covers minimum energy efficiency requirements for a range of residential, commercial and industrial electrical products, which if prescribed under the legislation (the E3 program¹) may not be sold unless they comply (includes split A/C units, power distribution transformers, electric motors etc.).
- c) Installation of RCDs at residential premises to be leased or sold, to ensure the safety of their installations.
- d) Prohibition on interference with an electrical installation (refers to prohibiting the placing of thermal insulation so that a part of the electrical installation becomes unsafe);
- e) Supply of electricity to consumers – this part covers electricity utility obligations such as for installation inspection, under the oversight of EnergySafety WA.
- f) Vegetation control (near power lines) safety requirements – training and safe clearances requirements
- g) Approval requirements for electrical appliances and equipment – currently 56 types of electrical products (mostly common electrical white goods, also hand-held equipment and RCDs) are prescribed under legislation that has operated for many years across Australia, to ensure that these products have been tested and certified to comply with national standards before they are allowed to be sold. This “Uniform Approvals Scheme” is being progressively updated across Australia by replacement with the Electrical Equipment Safety Scheme (EESS) which takes a more risk based approach to deciding which products need independent testing and certification, and which may have a lesser due process for ensuring safety. WA has not yet adopted the EESS (details at www.ERAC.gov.au) but expects to do so in the near future.

Note: the requirements referred to at (c) above have particular relevance to the residential Colleges at UWA.

3.3 Reporting electrical accidents and incidents at UWA

Reporting accidents, incidents, injuries, hazards and near misses is a legal requirement of employees under the *Occupational Safety and Health Act 1984*.

The reporting of electrical accidents is also a requirement of the *Electricity Act 1945* per Reg 63 of the *Electricity (Licensing) Regulations 1991*, which defines electrical accidents as an accident:-

- a) that results from a sudden discharge of electricity or that otherwise has, or is likely to have, an electrical origin; and
- b) that causes, or is likely to cause, danger to life, a shock or injury to a person or loss of or damage to property.

The regulations also state that if employees report an incident of this type to their employer, then the obligation to report it to EnergySafety passes to the employer.

In case of a safety incident at UWA:

1. the “Confidential Incident / Injury / Near Miss Report Form” needs to be completed promptly and sent to UWA Safety, Health and Wellbeing within 24 hours – refer to:-
<http://www.safety.uwa.edu.au/incidents-injuries-emergency/?a=2043788>
2. Electrical accidents, injuries and near misses at UWA must be immediately reported also to Campus Management Technical Officer (Electrical) on (08) 6488 5917 or to Building Services Electrical Supervisor on (08) 6488 2016.
3. UWA Safety, Health and Wellbeing will then undertake the statutory reporting referred to above in liaison with Campus Management, in addition to arranging investigation with a view to future incident prevention.

¹ Details may be found at www.energyrating.gov.au/programs/e3-program/

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4 RESPONSIBILITY STRUCTURE AT UWA

4.1 Overview

The principal manager is the Vice-Chancellor (VC) and this person supported by the management team has responsibility for the campus and related facilities in the context of providing a safe and healthy environment for UWA personnel, contractors, visitors and students. This includes:

a) Places of Work and Public places

Places of work and public places include all areas under the auspices of the University of Western Australia. Places of work also includes UWA satellite areas such as Rottneest Island, Jandakot, Albany, Gingin, Geraldton, Pingelly Farm and field research and excursion type work places.

Noted exclusions include the Guild of Undergraduates and UWA Sport and Recreation Association Inc. which are separate legal entities having their own policies and procedures. They are therefore not the responsibility of the University except that Campus Management retains responsibility for the building fixed **electrical installation**.

b) Places of accommodation

Places of accommodation include University Hall which is the UWA owned/operated hall of residence as well as residence/residential Colleges which are separate legal entities.

At UWA some student residences and Colleges are independent Business Units and operate outside the normal Campus Management / UWA management systems. In these instances UWA will refer the relevant policy to the respective safety officers for the Colleges and/or providers of student accommodation.

c) Places of joint work (e.g. research activities) with others

Where UWA personnel are carrying out work at UWA premises jointly with personnel or contractors of the Commonwealth Government, such as CSIRO staff, then the full requirements of the *Work Health and Safety Act* and its regulations must be satisfied. In terms of electrical safety requirements this outcome is to be achieved by complying with all relevant requirements of the Code **Managing Electrical Risks in the Workplace**.

4.2 Delegation framework

The VC delegates control over the University's physical infrastructure to the Chief Operating Officer who further delegates control to the Director, Campus Management.

For **electrical installations**: responsibility for compliance, management and safety is delegated to Campus Management.

For the **communications and extra low voltage cable system**: responsibility for compliance, management and safety is delegated to Campus Management.

For the **telephone equipment**: at UWA responsibility for compliance, management and safety is delegated to Information Services.

For **electrical equipment** which forms part of the building management (e.g. air conditioning) facilities, responsibility for compliance, management and safety is delegated to Campus Management.

For **electrical equipment** which connects to the electricity supply by a cord and plug within Business Unit work places: compliance, management and safety are the responsibility of that **Business Unit**. Business Unit refers to a School, Faculty, Division, Department, Cost Centre or Unit designated by the Vice-Chancellor as responsible for an activity of the University, including activities conducted with external parties where the University has responsibility for physical infrastructure.

Each of the above referenced organisational units therefore has primary responsibility for the functions described, to ensure compliance with all relevant statutory requirements and provide a safe working environment for workers, student and the public at all parts of UWA operations. The following paragraphs expand on some of these responsibilities and how they are to be exercised.

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4.3 Campus Management responsibilities

Campus Management is responsible for the Crawley campus electricity distribution system that is connected to the Western Power 66/6.6kV substation off Fairway. This 6.6kV distribution system provides electricity supply to individual buildings, their main distribution switchboards, sub switchboards and all associated ducts, cable trays and fixed wiring including final sub-circuits up to and including:

- Electrical socket outlets;
- Isolation switches forming part of the **electrical installation**;
- Installed lighting and its light switches and fittings;
- Permanently wired electrical equipment isolating switches and cable connections up to terminals of the equipment;
- Permanently wired Uninterrupted Power Supply (UPS) systems;
- Electrical equipment or appliances supplied by Campus Management and for which Campus Management is responsible under the maintenance budget, including portable electric fans and heaters, cleaning equipment, room air conditioners, drinking fountains and similar.

Campus Management's responsibilities include:

- a) UWA employee Category 1, 2A, 2B, 3A, 5A and 5B **competent persons** being listed on the UWA Electrical Workers Register maintained by Campus Management as required under Regulation 57 of the Electrical (Licensing) Regulations 1991. Business Units are obliged to notify the Senior Technical Officer (Electrical) in Campus Management of their licensed category 2A, 2B, 3A, 5A and 5B **competent persons** so that an up-to-date register can be maintained.
- b) Keeping an up-to-date record and plans of the **electrical installation** and the **communications and extra low voltage cable system** across the Crawley campus and satellite UWA Facilities. This includes in ground services and their reticulation in each UWA building.
- c) Preparing and keeping current, life cycle upgrading of the whole **electricity distribution system**, the various building **electrical installations** and the **communications and extra low voltage cable system** with annual budget submissions for necessary works separated from annual maintenance works.
- d) Examine, and if necessary amend, **electrical installation** and **communications and extra low voltage cable system** work proposed by Business Units (including Campus Management), architects, any consultant, project manager, or UWA affiliated entity, as part of major refurbishments or new building work at UWA sites. **Such work not to proceed until UWA Campus Management electrical and communications approval has been given.**
- e) Ensuring that **electrical installation** and **communications** work is performed in accordance with statutory requirements and the UWA Project Management and Design Guidelines Handbook, Section C (being revised during 2014). Electrical Services Guidelines and the UWA Data Communication Cabling Standards and Specifications.

The responsibility framework relies on persons who have recognised competence for specific types of electrical work or activities. These are referred to as **competent persons**, within this Procedure document.

A **competent person** is a person with the necessary practical and theoretical skills, acquired through training, qualification or experience or a combination of these, to correctly and safely perform tasks within the scope of electrical work approved by management.

Competent persons will have an understanding of the appropriate legal requirements for the work they are performing and the authority under which they are operating.

The various categories of **competent person** for specific types of electrical work or activities at UWA are as follows, and these are described in more detail at **Appendix A**:

- Licensed electrician who is also listed as a nominee on the In-House Electrical Installing Licence
- Licensed electricians employed by UWA Business Unit or Campus Management
- Licensed electrical contractor engaged by Campus Management
- Australian Communications and Media Authority (ACMA) accredited communications cabling installer

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- Technically qualified UWA employee with special electrical permit for work on LV electrical equipment
- Trained UWA employee (not a special permit holder), who is approved to assist electricians and special electrical permit holders in electrical equipment design, assembly, modifications, testing and repair while under their direct supervision.
- Testing contractor employed by a Business Unit to assess electrical equipment (test, tag etc.)
- UWA employed person or contractor holding a Restricted Electrical Licence to disconnect-connect electrical equipment
- Person holding a Restricted Registration from an ACMA accredited registrar for communications work

4.4 Responsibilities of Competent Persons

It is the responsibility of each **competent person** to only undertake electrical work within the scope defined by their Category approved by management under Sections 4.12 and 4.13 and listed in the register of **competent persons** maintained by Campus Management or each Business Unit.

4.4.1 General

It is the responsibility of the **competent person** to refuse to undertake electrical work outside their area of expertise without guidance from a suitable **competent person**.

The **competent person** shall undertake work in a manner that ensures that both he/she and other persons are exposed to the least possible degree of danger. It is the responsibility of the **competent person** to inform management of electrical and other safety hazards they identify in the course of their work.

4.4.2 Work on the electrical installation and the communications and ELV cabling system

Such work shall only be undertaken under Campus Management approval and management.

Category 1, 2A, 2B, 5A and 5B **competent persons** shall be familiar with EnergySafety's "Code of Practice – Safe Low Voltage Work Practices by Electricians" issued by the Director of Energy Safety April 2008 – Department of Consumer and Employment Protection; and with the booklet "Safety Guidelines for Electrical Workers" Energy Safety 2011.

4.4.3 Work on electrical equipment

All work on **electrical equipment** shall only be undertaken by **competent persons** (see Sections 4.3 and 4.4).

Work on **electrical equipment** and on **communications equipment** shall be done in compliance with relevant Australian Standards and ACMA standards. A printed copy of all relevant ACMA and Australian Standards shall be kept in the work area for reference.

4.4.4 Work on energised electrical installations and electrical equipment

Unless there is no alternative, work on **electrical installations** and on **electrical equipment** will be carried out with the power disconnected and / or the system de-energised, in accordance with the Code of Practice issued by the Director EnergySafety, the WA Commission for Occupational Safety and Health Guidance Note "Isolation of Plant" 2010, and the Safe Work Australia Code **Managing Electrical Risks in the Workplace**.

4.5 Responsibilities of Safety, Health and Wellbeing

UWA Safety, Health and Wellbeing in Human Resources will be routinely involved in facilitating safety information, relevant Australian Standards, training and audit processes associated with this Procedure.

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5 SPECIFIC ELECTRICAL ACTIVITIES – REQUIREMENTS

5.1 Control of electrical work and communications systems work

Campus Management is the only UWA authority with power to approve work to be carried out on the **electrical installation** and **communications and extra low voltage cabling system** in any UWA building.

Where a UWA approved contractor is to be employed for this work by a Business Unit other than Campus Management, the scope of work is to be approved through Campus Management as above before the work commences.

Within a maximum of 2 weeks from completion of each contract, the contractor is to supply Campus Management with a sketch and details showing the works which have been carried out and a copy of the Notice of Completion (or Electrical Safety Certificate, in the case of electrical work of scope not requiring notification) provided to Western Power (the electricity network operator) under the *Electricity (Licensing) Regulations 1991*, or the TCA1 notice for completion of any communications system work.

Failure of a UWA endorsed contractor to provide the information required above will render that contractor liable to have their name removed from the approved contractor list and be barred from any future work in UWA premises.

Where a UWA approved electrical contractor has been given exclusive possession of a site on University property, the contractor is responsible under the *Occupational Safety and Health (WA)* legislation and the *Electricity Act 1945* and its regulations for that site and not the University. The contractor is still responsible for providing Campus Management with a sketch and details showing the works which have been carried out and a copy of the Notice of Completion (or Electrical Safety Certificate, in the case of electrical work of scope not requiring notification) provided to Western Power under the *Electricity (Licensing) Regulations 1991*, or the TCA1 notice for completion of any communications system work. Otherwise this Procedure applies.

On large construction sites the Principal Contractor is responsible for ensuring health and safety at the construction project. This will include compliance with the requirements of the *Occupational Safety and Health (WA)* legislation outlined in Section 3.1 of this Procedure. It also includes responsibility for investigating and reporting to the regulators WorkSafe and EnergySafety on electrical accidents and incidents.

5.2 Management of electrical equipment safety by Business Units

5.2.1 Electrical equipment

Business Units are responsible for all **electrical equipment** in their area except for that provided in their area by and maintained by Campus Management and Information Services.

Business Unit responsibilities for **electrical equipment** include the purchase, issue, repair, maintenance, modifications, inspection, testing (where necessary), tagging, and registering of such equipment; the safety of such equipment; and its compliance with the rules and codes of relevant regulatory bodies and Australian Standards.

Business Units shall implement a Business Unit Procedure governing privately owned **electrical equipment** used in their Business Unit.

Business Units shall maintain a register of **electrical equipment** located in **hostile** areas including UWA manufactured and certified electrical equipment as per Section 7. Staff shall be allowed access to the information in this register.

Business Units shall nominate **competent persons** (refer Appendix A for listing of categories and scope of work) for the various electrical activities to be undertaken, ensuring that their competencies meet the specified requirements of the tasks to be undertaken. The names, positions, training, qualifications and experience of these **competent persons** shall be listed in the Business Unit register.

Only **competent persons** shall be used by a Business Unit in undertaking electrical work on its **electrical equipment**. This includes work on equipment that connects to the **communications and extra low voltage cable system**.

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Records of the inspection and testing of equipment are used to continually reassess risk of individual items and of classes of equipment and environments. Table 4 in AS/NZS 3760 provides guidance on the intervals between inspections and tests.

NOTE: Equipment is to be inspected and tested in compliance with AS/NZS 5762 following any repairs that may have affected its electrical safety. For further assistance refer to:
<http://www.safety.uwa.edu.au/topics/electrical-safety>.

Category 1, 2A, 2B, 3A, 3B, 4, 5A and 5B **competent persons** shall be familiar with and understand the requirements of AS/NZS 3760. All testing will be performed only with appropriately calibrated (according to manufacturer's specifications) test equipment.

Electrical equipment failing design principles, as judged by a **competent person** shall be subjected to the design certification process (see Section 5.4).

Connection of **electrical equipment** to the **electrical installation** shall be by an approved socket outlet or through an isolation switch. Note that where connection is through an isolation switch that the connection is required to be made by a licensed Category 1, 2A or 5A **competent person**.

Where used, "power boards" (electrical portable outlet devices, or EPODs) shall incorporate a current limiting device (circuit breaker), have individually switched electrical socket outlets, and where practicable, be fixed with the outlets in the vertical plane and protected from mechanical, electrical or water damage.

Extension cords are only to be used as a temporary solution and are not to be installed as fixed wiring. The same applies to long Ethernet, computer and telephone cables.

Double adaptors and plugs with integral socket outlets or similar have no overload protection and are **NOT** to be used at UWA without written approval from the **competent person** in the particular Business Unit.

All in-house designed, manufactured and /or modified **electrical equipment** or **communications equipment** that uses or generates voltages above extra-low voltage (> 50 V ac or > 120 V dc) shall be subjected to, and approved under, the UWA Design Certification Process for **electrical equipment** (see Section 5.4) before being placed into service.

Connection of **electrical equipment** to the **communications and extra low voltage cable system** shall be by an approved fly or patch lead into an outlet or patch panel.

The *Department of Commerce, WorkSafe; Guide to testing and tagging portable electrical equipment and residual current devices at workplaces; April 2014*, other than construction sites requires that:

- A risk management approach is taken to determine the type of inspection and, if necessary, the type of testing required.
- Inspection needs to be done more frequently in an operating environment where electrical equipment is, during normal usage, subjected to adverse operating conditions likely to result in damage.

UWA uses a risk management approach to determine where specific testing of electrical equipment is necessary. This is achieved by defining workplaces as hostile or non-hostile electrical environments and then specifying the required frequency of **visual inspections** or **testing and tagging**. White visual inspection tags are available from Safety, Health and Wellbeing.

5.2.2 Informing Users

Each **Business Unit** shall ensure that all users of **electrical equipment** are adequately informed on electrical safety and are aware of their responsibilities under this Procedure. Users should be aware of the basic electrical safety features of the equipment and how to operate it safely.

The pamphlet "Electrical Safety – A User Guide to the safe use of electrical equipment on UWA premises" is available on the UWA Safety, Health and Wellbeing web page and as a printed copy in all work areas. **Business Units** should ensure that all users of electrical equipment are made aware of this pamphlet.

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5.2.3 Responsibility of Users of electrical equipment in the Business Unit

Users shall read and comply with electrical safety information provided to all staff. Users should be encouraged to take note of updates that are provided from time to time through UWA Safety, Health and Wellbeing, Campus Management, trade associations and commercial suppliers.

Users shall not interfere with marker tags or labels on **electrical equipment** or with the tagging procedure used as a safety control by other persons. Such interference constitutes a very serious offence which will lead to disciplinary action.

Users of **electrical equipment** within a **Business Unit** are responsible to ensure that the equipment is set up correctly and used safely. Users are not permitted to repair, modify, or interfere with this equipment in any way.

Users shall ensure that **electrical equipment** in “electrically hostile environments” (see section 5.3) has a current inspection/test tag attached before using the equipment. If no tag is attached or if the equipment is overdue for inspection / testing and *tagging, it is the user's responsibility:-*

- Not to use the equipment, and
- Bring the equipment to the attention of their supervisor, a **competent person** or Business Unit management.

If a user suspects that equipment or associated wiring may be in a dangerous condition, the user is to:-

- Switch off and unplug the equipment (if safe to do so); and
- Notify their supervisor, **competent person** or Business Unit management immediately.

If the problem appears to be with the building fixed wiring, the user should:-

- Telephone the Campus Management help desk on 6488 2025.
- Place a notice on the equipment stating “FAULTY – DO NOT USE”.

5.2.4 Privately owned electrical equipment use in Business Units

The owner of privately owned **electrical equipment** to be used in a **Business Unit** is responsible for ensuring that it complies with the appropriate Australian / International electrical manufacturing standards and that the equipment is maintained in a safe condition by the user. The equipment should be suitable for 230 volts nominal ac at 50 Hertz and use only Australian pattern 3 pin or 2 pin plugs and have necessary Australian approval certification and compliance labels including CE, ACMA “C” tick with the Australian N number etc. as relevant.

Business Units may require that all non-UWA owned **electrical equipment** used in their Business Units be inspected or tested and tagged as appropriate under AS/NZS 3760 before being used in UWA premises.

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5.3 Electrical equipment inspection, testing and tagging

5.3.1 General

It is a requirement that all electrical equipment in long-term accommodation be inspected at 2 yearly intervals in accordance with Table 4 in AS/NZS 3760.

Appliances likely to be used in an electrically hostile environment (see section 5.3.3) need to be tested and tagged in accordance with AS/NZS 3760.

The following are excluded from this Procedure's electrical testing and tagging requirements:

- Electrical equipment located in non-hostile environments (see section 5.3.3)
- Privately owned electrical appliances in short-term serviced accommodation facilities owned or operated by UWA or UWA contractors;
- Privately owned electrical appliances in long-term accommodation self-contained and domestic houses / units;
- Privately owned electrical appliances where the owner ensures that the appliance complies with appropriate Australian/International electrical manufacturing standards, is suitable for 230 volts alternating current at 50 Hz frequency and uses only Australian pattern 3 pin or 2 pin plugs;
- Concessional areas of the University such as banks, bookshops etc. in which the concessional manager is responsible for electrical safety but Campus Management retains responsibility for the building fixed **electrical installation**;
- Designated construction sites managed by UWA contracted organisations; and
- Electrical appliances of a temporary nature electrically assessed as part of a hire agreement where responsibility for inspection, testing and tagging passes to the hirer under Clause 1.2.4.2 of AS/NZS 3760

5.3.2 Inspection

Inspection is the first step taken by an appropriate **competent person** by following the procedures detailed in Section 2.3 of AS/NZS 3760. This confirms that the appliance and its supply cord is of sound physical construction, is voltage compatible (overseas equipment, visitor equipment), switches are operable, that all appropriate guarding and housing screws are secure and that appliances have necessary certification including CE, ACMA "C" tick, "N" tick compliance labels etc.

Standard **AS/NZS 3760: In-service safety inspection and testing of electrical equipment** specifies procedures for the safety inspection and testing of low voltage single phase and poly-phase (e.g. nominal 230 V and 410 V) electrical equipment, connected to the electrical supply by a flexible cord and / or connecting device, which is new equipment placed into service for the first time, is already in service, has been serviced or repaired, is returning to service from a second hand sale or is available for hire. At UWA this standard applies, but is not limited to:

- Portable, hand held and stationary appliances designed for connection to the low voltage supply by a flexible cord;
- Cord extension sets and outlet devices (also known as electrical portable outlet devices, EPODs or power boards);
- Flexible cords connected to fixed equipment in hostile environments;
- Portable isolation transformers (includes power adaptor / plug pack, both of the transformer and switch-mode type);
- RCDs – portable type (PRCD), socket outlet type and fixed switchboard type;
- Commercial and industrial battery chargers; and
- Portable and transportable 410 V heavy duty tools such as high pressure washers, concrete grinders and welders

Records of inspection and testing of equipment are used to continually reassess risk of individual items and of classes of equipment and environments. Table 4 in AS/NZS 3760 provides guidance on the intervals between inspections and tests.

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5.3.3 Risk assessment – General

Risk assessments must be based on relevant factors including:

- Operating and storage environment;
- Usage (particularly the movement of the equipment and flexing of the supply cord);
- Equipment / characteristics (function, make and model);
- Experience with the equipment;
- Age of the equipment;
- Electrical safety knowledge of typical users; and
- Previous inspection and testing results.

Electrical equipment in a **hostile environment** is one wherein the equipment or appliance and its flexible supply cord is normally subjected to events or operating conditions likely to result in damage to the equipment or a reduction in its life span e.g., workshops, laboratories etc. This includes but is not limited to physical abuse, exposure to moisture, heat, vibration, corrosive chemicals, and dust. This equipment requires electrical testing and tagging by a **competent person** as defined in this procedure.

A **non-hostile environment** is a workplace that is dry, clean, well-organised and free of operating conditions that may result in damage to electrical equipment or the flexible supply cord e.g. office areas.

Electrical equipment failing design principles, as judged by a **competent person** shall be subjected to the design certification process (see Section 5.4).

Note that all electrical equipment (including detachable cord sets) requires pre-use and in-service visual inspection for obvious faults. It may also require electrical testing, tagging and registering as follows.

5.3.4 Equipment not requiring in-service testing but which requires visual inspection

Note: The *Department of Commerce, WorkSafe; Guide to testing and tagging portable electrical equipment and residual current devices at workplaces; April 2014*, other than construction sites, allows for equipment in risk assessed, non-hostile, low risk workplaces to be visually inspected without a requirement to conduct testing and tagging. This includes:

- (i) All **electrical equipment** with a negligible risk assessment used in a non-hostile environment.
- (ii) All “NEW” **electrical equipment** displaying Australian or equivalent international approval markings showing it complies with relevant safety standards. The manufacturer is considered to be responsible for the item’s safety, although the item should be visually inspected and tagged before entering into service; and
- (iii) All **electrical equipment** excluded by the scope of AS/NZS 3760 including:
 - Equipment which would need to be dismantled to perform the inspection and tests specified in the Standard;
 - Equipment such as suspended light fittings at a height of 2.5 metres or greater above the ground, floor or platform;
 - Stationary equipment (> 18 kg and no carrying handles) connected by a flexible cord or cable which is not flexed during normal use or exposed to abuse or damage in a hostile environment; and
 - Equipment connected by fixed wiring.

5.3.5 Equipment which requires in-service testing and tagging

- (i) All equipment with a medium or high risk assessment (i.e. likely to be used in an electrically hostile environment).
- (ii) All repaired **electrical equipment**, where repairs may have affected the electrical safety, to be inspected and tested before returning to service; and
- (iii) All second-hand (including loaned to UWA) **electrical equipment**, to be inspected and tested before entering into service.

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Business Units shall ensure that all non-installation electrical equipment used in electrically hostile environments is tagged (using durable labels). It is suggested the following information be on the tags which are available from UWA Safety, Health and Wellbeing:

- UWA logo;
- Business Unit;
- Equipment ID number (both visual and machine-readable);
- Generic equipment description (e.g. power board, desk lamp, drill, instrument)
- Last risk classification (by retest frequency);
- Last test date;
- 1 Competent person (name and ID number);
- Next test date; and
- Provide for dated inspection marks (e.g., similar to fire extinguisher tags)

5.3.6 Record keeping

Business Units will record inspection and testing results. The following information will be recorded and be accessible to all staff, especially **competent persons** for use in risk assessment:

- Equipment ID number;
- Equipment description (e.g. power board, desk lamp, drill, instrument, etc.);
- Location of equipment;
- Last risk classification;
- Last test date;
- Competent person (name and ID number);
- Test results (PASS / FAIL, cause of failure, [optional information: values measured, test equipment used, etc.]); and
- Number of inspections performed

5.4 **Electrical equipment design certification**

5.4.1 Overview

Design certification is a process to confirm equipment complies with relevant Australian and or ACMA safety standards. All new equipment designed or modified at UWA is required to undergo the design certification process. Existing equipment (prior to the adoption of this Procedure) will only be required to undergo the certification process if and when it is repaired or modified.

Equipment designers are encouraged to vet their new designs with a **competent person** of Category 3A, as this person will be the holder of a special permit for electrical work on electrical equipment, before construction begins.

5.4.2 Equipment required to be certified

The following electrical equipment is required to be certified:

All in-house newly designed and / or built electrical equipment that meets one or more of the following:

- Consumes power above extra low voltage (> 50 V ac or > 120 V dc);
- Generates voltages above extra low voltages while delivering currents above 1 mA; and
- Generates high voltages (>1,000 V ac or > 1,500 V dc);

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- All repaired or modified equipment, meeting one or more of the above conditions, where the work undertaken may have affected the safety of that equipment;
- All previously in-house designed equipment meeting one or more of the above conditions, undergoing repairs or modifications; and
- All electrical equipment entering UWA with questionable design issues or forwarded by a competent person.

5.4.3 Who performs the certification

Certification is to be undertaken by a **competent person** (see sections 4.3 and 4.4).

5.4.4 How equipment is certified

Equipment is certified as being in compliance with relevant Australian or ACMA Standards.

Particular attention should be paid to the requirements of AS 3100 – “Approval and test specification – General requirements for electrical equipment”. Other standards which are specific to the prescribed item must also be considered. For example, much of the University in-house designed research equipment would require consideration of AS 61010.1 – “Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements”. If the equipment generates or uses substantial RF (radio frequency) power then AS 1188 – “Radio transmitters and similar equipment – Safe practices” will need to be considered. Similarly, lasers will need consideration of AS 2211. Communications equipment will need consideration of AS/NZS 60950.1, AS/ACIF S008 and AS/ACIF S009.

Useful guidance in judging compliance with relevant Australian Standards of equipment designed for laboratory and research environments is available in the UWA in-house course titled “*Electrical Equipment and Appliances at UWA: Designing, assembling and inspecting for electrical safety*”. The first of these courses is to be run during April 2015.

5.4.5 Tagging certified equipment

All certified equipment will have a durable label containing the following information:

- UWA Certificate Number (with the format XXYYY budget code CZZZZZ);
- Description (e.g., power supply, heater controller, instrument, etc.);
- Model, (identity linked to the item’s documentation);
- Budget Unit;
- Date certified; and
- Competent person (name and ID number of the person certifying the equipment).

5.4.6 Record of certified equipment

Business Units are required to maintain an equipment register. The following information is recorded:

- UWA Certificate number;
- Description (e.g., power supply, heater controller etc.);
- Model, (identity linked to the item’s documentation);
- Budget Unit;
- Department / Unit (owner);
- Location of the equipment;
- Designer / modifier (name and Department / Unit);
- Description of work undertaken (brief description of the design or of the modifications in relation to electrical safety);
- Date certified; and
- Competent person (name and ID number of person certifying the equipment).

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5.5 Electrical safety audits

5.5.1 First external electrical safety audit on this Procedure

As soon as this Procedure has been approved it will be circulated to all University **Business Units** for implementation.

To assist **Business Units** in their compliance endeavours, the UWA in-house course titled “*Electrical Equipment and Appliances at UWA: Designing, assembling and inspecting for electrical safety*” will be run during April 2015.

Six months from the date of running this course, an external auditor will be contracted to:

- 1 Carry out a University-wide audit of the implementation of this Procedure; and
- 2 Provide recommendations on measures required to bring implementation up to the standards and practices stated in this Procedure where full compliance has not been achieved.

5.5.2 Regular electrical safety self-audits

Following the first external audit set out in Clause 5.5.1 above, self-audits for electrical safety shall be undertaken on a regular basis by the University. The first self-audit will be scheduled no later than 1 year from the date of the external audit specified in Clause 5.5.1. Subsequent self-audit intervals shall not exceed 2 years.

The self-audit shall be designed by UWA Safety, Health and Wellbeing working with Campus Management.

The self-audit for the campus-wide **electrical installation** and the **communications and extra low voltage cabling system** shall be undertaken by **Campus Management**.

Self-audits shall be implemented by **Business Unit** line management with the facilitation of the Business Unit’s electrical safety **competent persons**.

5.6 Isolation techniques and resuscitation training

For UWA, competent persons shall be trained in the methods of isolation techniques and resuscitation of persons who have suffered electric shock.

Re-training of competent persons in these skills should occur at appropriate intervals not longer than 3 years. This is the responsibility of Campus Management or the Business Units, depending upon the organisation to which the person is attached as an employee.

6 DOCUMENT HISTORY

This Procedure supersedes Campus Management’s “Regulations and controls governing electrical work at UWA” first issued in August 2002 (with revisions) and UWA Safety, Health and Wellbeing’s “Electrical equipment safety policy” issued in March 2008 (with revisions).

This hazard management Procedure should be read in conjunction with the University’s Safety and Health Policies and other relevant policies and procedures of the University.

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7 APPENDIX A

7.1 Categories of Competent Persons

		CATEGORIES OF COMPETENT PERSONS AND THEIR APPROVED SCOPE OF ELECTRICAL WORK (See section 7.2 for assessment of competent persons.)
1		UWA employed Campus Management licensed electrician who is approved by EnergySafety WA (the regulator) as one of the nominees on the UWA In-House electrical license.
2	A	<ul style="list-style-type: none"> o UWA employed Campus Management licensed electrician who undertakes electrical installation work; or a o Licensed electrical contractor used by Campus Management for electrical installation work; or o UWA employed licensed electrician in a Business Unit who undertakes electrical equipment work including risk analysis, inspection, testing, tagging and registering electrical equipment.
2	B	A person who holds a current open registration for communications cabling from an ACMA accredited registrar. This person may also hold a Category 2A license as above.
3	A	UWA technician-type employee who is technically qualified, holding a special electrical permit for electrical equipment work and approved by a Business Unit to design, assemble, modify, test, repair, inspect and certify laboratory/research type LV electrical equipment to Australian Standards, to assess electrical equipment risk and to undertake routine inspection, testing, tagging and registering of electrical equipment in compliance with AS/NZS 3760.
3	B	Trained UWA employee (not a licensed electrician or special permit holder), approved by a Business Unit to assist a Category 1, 2A, or 3A UWA employed competent person to design, assemble, modify, test and repair LV electrical equipment to Australian Standards (i.e., works under direct supervision of a licence or permit holder for any electrical work).
4		<ul style="list-style-type: none"> o Trained UWA employee (not a special permit holder) approved by a Business Unit to assess electrical equipment risk and to undertake routine inspection, testing, tagging and registering of electrical equipment in compliance with AS/NZS 3760. o Testing contractor employed by a Business Unit to assess electrical equipment risk and to undertake routine inspection, testing, tagging and registering electrical equipment in compliance with AS/NZS 3760.
5	A	UWA employed person or contractor holding a Restricted Electrical Licence to disconnect-connect electrical equipment to the electrical installation according to the specific conditions of their Restricted Electrical Licence.
5	B	A person holding a Restricted Registration from an ACMA accredited registrar for communications work on lifts, security, fire and associated services.

NOTES:

- a) Category 1 **competent persons** are responsible for technical liaison with the electricity network operator Western Power and with the regulator EnergySafety, reporting electrical incidents (refer Clause 3.3) and assisting UWA Safety, Health and Wellbeing and Campus Management with investigations into electrical incidents.
- b) Direct supervision means that the supervising Category 2A or 3A **competent person** is within sight of or within audible range of any LV electrical work being done by the person being supervised.
- c) UWA employee Category 1, 2A, 3A and 5A **competent persons** shall be listed on the UWA Electrical Workers Register maintained by Campus Management as required under Regulation 57 of the Electrical (Licensing) Regulations 1991. Business Units **MUST** notify Campus Management of their licensed category 1, 2A, 3A and 5A **competent persons** so that an up-to-date register can be maintained.
- d) Campus Management also maintains a register of approved contractors.

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7.2 Guidelines for assessment of competent persons

Prior completion of relevant training courses is a pre-requisite for all categories of **competent person**.

Competent persons are required to successfully complete other relevant training courses every four years and it is recommended that they also complete resuscitation training at appropriate intervals not longer than 3 years.

CATEGORY 1

UWA employed Campus Management Electrician licensed by the Electrical Licensing Board who meets all the requirements for Category 2A competent person and additionally, is approved by EnergySafety WA (the regulator) as one of the nominees on the UWA In-House electrical license. This person is required to have good knowledge of the regulations governing electrical installing work, including when notices are required to be given for proposed electrical work and also completed electrical work, as well as supervision requirements for trainees and safe work practices for electrical workers on UWA campuses.

Assess by all of the below:

- Copy of their valid WA Electrician's licence;
- Evidence of continuing acceptance as a nominee by EnergySafety (which requires satisfactory conduct as a nominee).

CATEGORY 2 A

Electrician licensed by the Electrical Licensing Board who has been approved by Campus Management to work on electrical installations, to assess electrical equipment risk and to undertake routine inspection, testing and tagging and registering of electrical equipment.

Assess by all of the below:

- Copy of their valid WA electrician's licence;
- Be knowledgeable on AS/NZS 3760:2003 Clause 1.4.5 on the requisites for a competent person to be able to inspect and test.

CATEGORY 2 B

Registered cabler approved by Campus Management to work on communications and extra low voltage installations and registered to perform Open cabling work.

Assess by all of the below:

- Copy of their valid registration details from an ACMA-accredited registrar

CATEGORY 3 A

Technically qualified technician-type employee who is the holder of a special electrical permit for electrical work to design, assemble, modify, test, repair and inspect LV electrical equipment to Australian Standards, to assess electrical equipment risk and to undertake routine inspection, testing, tagging and registering of electrical equipment in compliance with AS/NZS 3760.

Assess by all of the following:

- Holds special electrical permit (University Technician's Electrical Worker's Permit) issued by the Electrical Licensing Board for electrical work to design, assemble modify, test, repair and inspect LV electrical equipment.
- Holder will have worked on equipment containing low voltage electrical components for at least 6 years, supported by formal training in electrical, electronic or control systems technology or a qualification in one of the other physical sciences.
- Completion of Electrical Cord and Plug course at a registered Training Organisation.
- Completion of a Portable Appliance Testing (PAT) course at a registered Training Organisation.
- Completion of the UWA in-house course titled "*Electrical Equipment and Appliances at UWA: Designing, assembling and inspecting for electrical safety*".

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CATEGORY 3 B

Trained person approved by a Business Unit to work on electrical equipment and to routinely design, assemble, modify, test and repair electrical equipment. Any electrical work other than that exempted from licensing (e.g., LV cords/plugs work, LV appliance servicing, inspection and testing of LV electrical equipment), such as LV electrical equipment assembly including wiring work is carried out under the direct supervision of a Category 2A or 3A competent person.

Assess by all of the below:

- Completion of Electrical Cord and Plug course at a registered Training Organisation.
- Completion of a Portable Appliance Testing (PAT) course at a registered Training Organisation.
- Completion of the UWA in-house course titled “*Electrical Equipment and Appliances at UWA: Designing, assembling and inspecting for electrical safety*” (the first course is to be run during April 2015).

CATEGORY 4

Trained UWA employee or Testing Contractor approved by a Business Unit to assess electrical equipment risk and to undertake routine inspection, testing, tagging and registering of electrical equipment.

Assess by all of the below:

- Completion of Electrical Cord and Plug course at a registered Training Organisation.
- Completion of a Portable Appliance Testing (PAT) course at a registered Training Organisation.

CATEGORY 5 A

UWA employee or contractor tradesperson holding a Restricted Electrical Licence issued by the Electrical Licensing Board and who is approved by a Business Unit to disconnect-connect electrical equipment to the electrical installation according to the specific conditions of their Restricted Electrical Licence.

Assess by all of the below:

- Copy of their valid restricted electrical licence.

CATEGORY 5 B

Registered cabler approved by Campus Management to work on communications and extra low voltage installations registered to perform Restricted or Lift cabling work.

Assess by all of the below:

- Copy of their valid registration details from an ACMA-accredited registrar.

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8 APPENDIX B

8.1 Certification and notification of electrical work

All electricians who repair or modify any electrical installation on a UWA asset are required to complete the Electrical Safety Certificate and provide this to the customer (who is Campus Management for UWA). All relevant data regarding the works are to be filled in by the licensed electrician.

All persons who repair or modify any part of the communications network are required to complete the TCA 1 and TCA 2 notice as appropriate and provide a copy to Campus Management (as the customer for UWA).

Within a maximum of 2 weeks from completion of each contract, approved contractors are required to supply to Campus Management a sketch and details showing the works which have been carried out.

Failure to complete the required information to enable Campus Management to maintain accurate and up-to-date records of all UWA electrical installations and communications and extra low voltage cabling systems will render that person liable to have their name removed from the approved list of competent persons and be debarred from further work on these at UWA.

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9 APPENDIX C

9.1 Legislation and other references

Note:

To access WA legislation via the internet, go www.slp.wa.gov.au, select “West Australian Legislation Databases”, click onto “Acts in force” or “Subsidiary legislation in force” (which gives access to regulations) and then access the list of legislation in alphabetic listing by clicking onto the letter that corresponds to the first letter of the name of the Act or Regulations, then choose which legislation you require, either in PDF or MSWord format, for downloading (and saving if desired).

To access Commonwealth government legislation, go to www.comlaw.gov.au and then at the top toolbar select “Acts” or “Legislative Instruments” (which gives access to regulations) and then follow a similar procedure to download the desired legislation.

- Electricity Act 1945
- Electricity (Licensing) Regulations 1991
- WA Occupational Safety and Health Act 1984 and Regulations 1996.
- WHS Work Health and Safety Act and Regulations (Model) 2011
- UWA Pamphlet: “Electrical Safety – A User Guide to the safe use of electrical equipment on UWA premises” 2010
- The University of Western Australia Project Management and Design Guidelines Handbook, Section C Electrical Services Guidelines. (To be updated during 2014)
- The University of Western Australia Data Communication Cabling Standards and Specifications
- ANU in-house electrical training guide
- “Safety and Employment protection” Department of Commerce – Annual Report 2009-2010
- “Safety priorities for working with electricity”: Department of Commerce, WorkSafe
- “Electrical appliances and equipment – Importing, selling or hiring”: Energy Safety
- “Safety Guidelines for Electrical Workers”: Energy Safety 2009.
- “Guide to testing and tagging portable electrical equipment and residual current devices at workplaces” ,WorkSafe WA, April 2014
- Code of Practice – “Safe low voltage work practices by electricians”: Energy Safety April 2008
- Standards Australia Publications
- AS 2243.7 – Safety in laboratories; Part 7 – Electrical aspects
- AS/NZS 3000 – Wiring rules. (Electrical installations)
- AS/NZS 3012 – Electrical installations – Construction and demolition sites
- AS/NZS 3017 – Electrical installations – Verification guidelines
- AS/NZS 3019 – Electrical installations – Periodic verification
- AS/NZS 3100 – Approval and test specification – General requirements for electrical equipment
- AS/NZS 3191 – Electric flexible cords

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- AS/NZS 3200.1.0 – Medical electrical equipment; Part 1.0: General requirements for safety – Parent Standard
- AS/NZS 3760 – In-service safety inspection and testing of electrical equipment
- AS/NZS 3820 – Essential safety requirements for electrical equipment
- AS/NZS 4836 – Safe working on low voltage electrical installations
- AS/NZS 5761 – In-service safety inspection and testing – Second hand electrical equipment prior to sale
- AS/NZS 5762 – In-service safety inspection and testing – Repaired electrical equipment
- AS/NZS 60950.1 – Information technology equipment – Safety; Part 1: General requirements
- AS 61010.1 – Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1 – General requirements
- AS 61010.031 – Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test
- AS61010.2 – Part 2.032: Particular requirements for hand-held and hand-manipulated current sensors for electrical test and measurement
- AS/NZS 60950.1 – Information Technology Equipment – Safety
- AS/ACIF S008 – Requirements for customer cabling products
- AS/ACIF S009 – Installation requirements for customer cabling (Wiring Rules)
- ACMA - Labelling requirements summary fact sheet
- Telecommunications Cabling Provider Rules 2000
- Telecommunications Labelling (Customer equipment and customer cabling) Notice 2001
- Radio communications Labelling (Electromagnetic compatibility) Notice 2008
- Radio communications Labelling (Electromagnetic compatibility) Amendment Notice 2009 (No.1)
- Radio communications Devices (Compliance labelling) Amendment Notice 2010 (No. 1)

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