



UNIVERSITY
OF TASMANIA

ELECTRICAL SAFETY IN THE WORKPLACE POLICY

OVERVIEW

The University of Tasmania is committed to continuously improving the management and standards of Occupational Health and Safety. This commitment extends to protecting employees from electrical danger in the workplace.

DEFINITIONS

Accountable Person:

An individual, who assumes responsibility for the health or welfare of any other person in a workplace by providing instruction, direction, assistance, advice or service, is deemed an Accountable Person in accordance with the *Workplace Health and Safety Regulations 1998*. All management and supervisory staff (which includes those with responsibility for students) are therefore considered "Accountable Persons".

Electrical Equipment:

Wiring systems, switchgear, control gear, accessories, appliances, luminaries and fittings used for such purposes as generation, conversion, storage, transmission, distribution or utilization of electrical energy.

Competent Person:

A competent person is a person who has acquired through appropriate training, qualification or experience or a combination of these, the knowledge and skills to enable the person to perform the tasks required.

Conductor:

A wire or other form of conducting material suitable for carrying current, but not including wire or other metallic parts directly employed in converting electrical energy into another form.

Employee:

For the purposes of this Policy, employee refers to any staff member or to any student or visitor using plant. (Plant includes any machinery, equipment, appliance, implement or tool.)

Non-portable Equipment:

Non-portable equipment is equipment which must be installed by an appropriately qualified electrical worker, directly into a source of mains electrical power.

Portable Equipment:

Portable equipment is equipment which can be connected to a mains outlet socket via a sheathed flexible cord and a cord extension socket.

Qualified Electrical Person:

A qualified electrical person is a person who has undertaken an apprenticeship in the field of electrical work and has acquired an appropriate trade qualification from a recognised training institution and holds a current electrical licence.

RCD:

An RCD is a Residual Current Device commonly known as an Earth Leakage Device. A device intended to isolate supply to protected circuits, socket outlets or electrical equipment in the event current flow to earth exceeds a predetermined value.

Responsible Officer:

Deans, Heads of Division, Heads of School and Administrative Sections have been designated as Responsible Officers under the *Workplace Health and Safety Act 1995*.

Voltage:

Extra-low voltage- not exceeding 50 V a.c. or 120 V ripple free d.c.

Low voltage- exceeding extra-low voltage, but not exceeding 1000 V a.c. or 1500 V d.c.

High voltage- exceeding low voltage.

Note: Work on live conductors at these voltages must be taken very seriously. There have been more electrical fatalities throughout Australia from low voltage shocks than from contact with high voltage conductors. While not especially dangerous to the average person, voltages below 50 volts can also cause shocks and be hazardous to a susceptible person.

RESPONSIBILITIES**Accountable Persons:**

Ensure these procedures are implemented within their area of responsibility. Specific responsibilities for an Accountable Person are prescribed in the *Workplace Health and Safety Regulations 1998*, Division 3, Regulation 80 as;

“(1) An Accountable Person who causes the erection, installation or commissioning of any plant must ensure that any electrical installation associated with that plant complies with AS 3000.

(2) An Accountable Person must ensure that all electrical installations and equipment installed and operated in areas subject to a risk of gas or dust explosion comply with *AS 3000 - 2000 Electrical installations - buildings, structures and premises*.”

Employees:

Must comply with this policy and report all hazards and incidents to their Accountable Person as soon as practicable.

Responsible Officers:

Provide suitable facilities and resources to ensure the effective implementation of this policy.

ELECTRICAL SAFETY**1. General**

The effective management of electrical safety is designed to provide employees with protection from:

Electrical shock arising from:

- exposed contacts or wires;
- damaged insulation on equipment or extension leads;
- wet conditions in the area of equipment being used

Risk of fire from:

- heating of equipment;
- overloaded circuits;
- loose connections;
- short circuits;
- inappropriate electrical equipment in hazardous atmospheres

Risk of electrocution arising from:

- inappropriately installed equipment

2. Safe Working Procedures

These apply to all types of voltage work but electrical supply authorities usually undertake high voltage work and specific procedures apply.

- All mains and apparatus shall be regarded as “live” until proven “dead”. Special note shall be made to ensure all neutral cables and earth cables are proven “dead”.
- Avoid working on live components whenever possible.
- Confirm permission to isolate
- Fit an isolation tag. Refer to Isolation policy and procedures.
- Cover and insulate adjacent apparatus.
- Check test instruments before and after use.
- Start work only when authorized to do so.
- All extension leads and power tools that are being used in a dangerous situation should be used through either fixed or portable residual current devices
- All tagging and testing must be undertaken. This may be required prior to a new item being used, depending on the documentation that accompanies the item. It should not be assumed that a new item does not require tagging & testing.
- Always use personal protective equipment.

3. Qualifications Of Personnel

Any electrical work that is required to be undertaken where it is necessary to:

- Use a tool;
- Manually remove a fixed panel, or
- Manually disconnect protection barriers to gain access to electrical components,

must be carried out by personnel who hold appropriate qualifications and certificates as electrical workers as prescribed under The Electricity Industry Safety and Administration Act 1997 (No. 72 of 1997) and The Electricity Industry Safety and Administration (Consequential and Transitional Provisions) Act 1997 (No. 73 of 1997).

4. Multi-Outlet Power Boards And Double Adaptors

General Guidelines

The University discourages the use of multi-outlet power boards and double adaptors as they are vulnerable to damage from overloading and are susceptible to overheating. It is recognised that from time to time these devices will be used but power boards that are purchased must have an overload protection device as part of the device. Installation of extra mains power points should be arranged so that the use of these devices can be minimised and/or phased out.

Multi-outlet Power Boards and Double Adaptors in Workshops

AS/NZS 3012:2003 Electrical installations - construction and demolition sites states that double adaptors and three (3) pin plug adaptors (piggyback) are not permitted in workshops or on construction sites.

Where multi-outlet power boards are used in workshops these devices shall comply with *AS/NZS 3105:2002 - Electrical portable outlet devices* and comply with the following guidelines:

1. The enclosure shall be constructed of suitable impact resistant and durable material.
2. Outlets mounted on the device shall be protected against damage by suitable means such as covers or extended sides.
3. The flexible cord supplying the device shall be of the heavy duty sheathed type complying with *AS 3191 – Electric flexible cords*.

Multi outlet Power Boards and Double Adaptors in Laboratories

AS 2243 Part 7: 1991 Section 4 Safety in Laboratories states that additional permanent wired outlets are to be installed in laboratories so that each appliance uses a mains outlet as its electrical supply thus reducing the need to use multi outlet power boards.

REMEMBER: PIGGY BACKING OF DOUBLE ADAPTORS IS NOT PERMITTED UNDER ANY CIRCUMSTANCES

5. Electrical Extension Cords

Visual Inspection and Maintenance of Extension Cords

Extension cords must be kept in good condition and be inspected regularly via a visual inspection by the user to ensure that the cord's good condition is maintained. This visual check should include:

- That the cord is located in an area where it cannot be subjected to mechanical damage or damage by liquids or high temperatures.
- That the cord when stored is provided with protection against mechanical damage or damage by liquids, ie protective storage bag or storage cabinet.
- That the plug and socket are in good condition and properly secured to the cord.
- That there are no cuts or tears in the outer insulation of the cord.

Extension Cord Safety Procedures

When using extension cords the following safety procedures should be followed to minimise the risk of injury to employees:

- The maximum length of an extension cord shall not exceed 36 metres including the flexible cable attached to the appliance.
- Ensure that the cord when in use, is not coiled or placed under mats, as such a practice can lead to fire due to the cord overheating. Cords should be fully extended.
- Where there is a distance of more than 10 m between the appliance and the mains power socket, the cord should be supported off the ground.
- Ensure that cords do not cross passageways or access ways, as this may result in trips or falls.

6. Electrical Equipment In Hazardous Atmospheres

Accidents can occur when electrical installations are placed in areas that have hazardous atmospheres. Electrical installations such as motors, switches or lights may act as ignition sources when electricity comes into contact with hazardous materials such as flammable gases, solvents used in fume cupboards or vapours from flammable liquids. To determine if an electrical installation is in a hazardous environment AS 2430 and AS 2430 Parts 1, 2 and 3 *Classification of Hazardous Areas* should be consulted.

Electrical appliances used in these hazardous atmospheres must meet specific requirements. AS 2381 - *Electrical equipment in explosive atmospheres - selection, installation and maintenance* and AS 2381.1 - *General Requirements* defines the specific installation and equipment requirements for hazardous atmospheres. If appliances do not meet these specific requirements they must be removed from the hazardous area altogether.

7. Special Circuit Protection

Exposure to mains electrical currents can lead to electric shock or electrocution. A Residual Current Device (RCD) is a device intended to isolate supply to protected circuits, socket-outlets or equipment in the event of a current flow to earth, which exceeds a predetermined value. RCD's provide greater protection not currently available with conventional circuit breakers and fuses.

RCD's should be considered as protection on final sub circuits in work areas and the selection and installation of these devices is the responsibility of an appropriately trained and qualified electrical person.

8. Heating Equipment

Electrical heating appliances can be a common cause of fires. To prevent the possibility of fire the following safety precautions should be adhered to:

- Portable bar radiators shall not be used.
- Fan and all other heating equipment should be fitted with thermostat controls and be of the type that will automatically turn off if the appliance becomes overheated.

9. Reporting of Electrical Hazards/Accidents

- Electrical hazards should be reported on the University's Hazard Notification Form as soon as possible after detection of the hazard.

- Asset Management Services should be informed immediately (via the Head of School/Administrative Section or Employee Safety Representative) of the hazard and arrangements made for the appliance to be inspected by an appropriately qualified electrical person.
- Any person who has received an electric shock should report the incident to the Occupational Health & Safety Unit as soon as possible.

10. Periodic Testing Of Portable Appliances And Extension Cords

All portable electrical appliances and extension leads must be periodically tested and tagged under *AS/NZS 3760 In-Service safety inspection and testing of electrical equipment* and *AS/NZS 3012 Electrical installations - construction and demolition sites*.

These checks are to be undertaken at the frequency specified in the Standards, which range from 3 months for portable equipment used on construction and demolition sites to 5 years for office equipment.

Equipment must also be inspected and tested:

- prior to initial introduction to service;
- before return to service after a repair which could have affected the electrical safety, and
- at intervals not exceeding those specified in the Australian Standard.

A qualified electrical person or competent person shall undertake all testing and adhere to the testing and tagging procedures outlined in the relevant Standards.

11. Procedural Responsibilities

Employees shall accept the following responsibilities:

- To follow safe work practices to minimise the risk of injury from electricity.
- To immediately report all electrical hazards to their supervisor, Head of School/Section or employee safety representative. These hazards may include:-
 - (a) Cracked equipment
 - (b) Burnt outlets
 - (c) Burning smells
 - (d) Torn insulation on extension cords
- To complete a University Hazard Notification Form if an electrical hazard is recognised.
- If safe to do so, disconnect faulty electrical appliances from the power source and label "DO NOT USE - TO BE TESTED" in a clear manner.
- To advise the Occupational Health & Safety Unit immediately in the event of an injury occurring as a result of an electrical fault.

Responsible Officer/Accountable Persons shall accept the following responsibilities:

- To report all electrical hazards to Asset Management Services.
- Ensure that personnel undertaking electrical work, including tagging & testing, have received accredited training and that records are maintained.
- To fund the installation of mains power points in an effort to phase out the use of multi-outlet power boards and double adaptors.
- Installation, testing and maintenance of RCDs on portable equipment is the responsibility of Schools/Sections.
- Be responsible for the installation of portable appliances where power is taken from a mains power outlet via an electrical cord to the appliance, eg portable computer or office fan.
- To ensure that all electrical equipment purchased for heating purposes is fitted with thermostat controls to minimise the risk of fire through overheating.
- To ensure that a testing and tagging program is implemented in their School/Section and that all electrical appliances are tested and tagged as required by a competent person. Tagging & testing is funded by the school/section.
- Switchboard access is required at all times by qualified personnel and emergency services. There is to be no storage, items etc placed in front of switchboards at anytime.
- Responsible Officers must consider the provision of CPR training to employees and others inducted in carrying out electrical works. This training needs to be conducted at least annually. These persons must be fully conversant with emergency procedures.

Asset Management Services shall accept the following responsibilities:

- To undertake all electrical work other than the installation of portable appliances where power is taken from a mains power outlet via an electrical cord to the appliance, eg portable computer or office fan. Funding for electrical work shall remain the responsibility of Schools/Sections as appropriate.
- At the request of a School/Section, identify areas where the installation of RCDs would be beneficial and arrange for their selection, and installation.
- To arrange a competent person or electrical contractor to undertake testing and tagging work for schools/sections when requested.
- To fund the testing and maintenance of RCDs where they are part of the infrastructure, i.e. switchboards.

The Occupational Health & Safety Unit shall accept the following responsibilities:

- Provide advice on the University's policy in relation to electrical safety in the workplace.
- Keep statistical information on any injury or illness received through electrical incidents at the University and advise Workplace Standards Authority.

REFERENCES

The following documents have been used in the development of the University of Tasmania's Electrical Safety in the Workplace Policy and Guidelines:

- Workplace Health and Safety Act 1995
- Workplace Health and Safety Regulations 1998, Division 3, Regulation 80 (1)-(2)
- The Electricity Industry Safety and Administration Act 1997 (No. 72 of 1997)
- The Electricity Industry Safety and Administration (Consequential and Transitional Provisions) Act 1997 (No. 73 of 1997).
- AS3000 - 2000 -- Electrical installations - buildings, structure and premises
- AS3012 - 2003 -- Electrical installations: construction and demolition sites.
- AS3760 - 2001 -- In-service safety inspection and testing of electrical equipment.
- AS3105 -2002 -- Electrical portable outlet devices
- AS3191, Amendment 4-2002 - Electric flexible cords.
- AS2243, Amendment 1 - 2000 - Safety in laboratories - Part 7, Section 4

FURTHER INFORMATION

Further and more specialised information on any of the issues raised in this policy can be obtained from the relevant Australian Standard, Legislation or a specialist qualified electrical person.

Revised and Approved by OH&S Committee : 9th July, 2003

Disclaimer

This Policy was designed for use within the University of Tasmania. The University makes no guarantee and assumes no responsibility as to the absolute correctness for all circumstances or for the adaptation outside the University of Tasmania environment.