

ELECTRICAL WORK

LEARNING OUTCOME

Describe the requirements of the Queensland Electrical Safety Regulation 2013.

ASSESSMENT CRITERIA

- Describe the various types of electrical work, as defined in the Electrical Safety Regulation 2013.
- Describe the electrical testing and tagging criteria for the various types of work.
- Describe the requirement to use and test a residual current device in the various types of work.

REFERENCES

- 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

Competent person – a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to inspect and test electrical equipment.

ELECTRICAL WORK

ELECTRICAL RISKS

Electrical risks are risks of death, electric shock or other injury caused directly or indirectly by electricity. The most common electrical risks and causes of injury are:

- electric shock causing injury or death. The electric shock may be received by direct or indirect contact, tracking through or across a medium, or by arcing. For example, electric shock may result from indirect contact where a conductive part that is not normally energised becomes energised due to a fault (e.g. metal toaster body, fence)
- arcing, explosion or fire causing burns. The injuries are often suffered because arcing or explosion or both occur when high fault currents are present
- electric shock from 'step-and-touch' potentials
- toxic gases causing illness or death. Burning and arcing associated with electrical equipment may release various gases and contaminants
- fire resulting from an electrical fault.

Even the briefest contact with low voltage electricity at 50 volts for alternating current (V AC) or 120 volts for direct current (V DC) can have serious consequences to a person's health and safety. High voltage shocks involving more than 1000 V AC or 1500 V DC cause contact burns and damage to internal organs.

Electric shocks from faulty electrical equipment may also lead to related injuries, including falls from ladders, scaffolds or other elevated work platforms. Other injuries or illnesses may include muscle spasms, palpitations, nausea, vomiting, collapse and unconsciousness. Workers using electricity may not be the only ones at risk—faulty electrical equipment and poor electrical installations can lead to fires that may also cause death or injury to others.

Note: high voltage means voltage above 1000V AC or 1500V ripple-free DC.

MANAGING ELECTRICAL RISKS

A person conducting a business or undertaking (PCBU) has the primary duty under the Electrical Safety Act 2002 (ES Act) to ensure the person's business or undertaking is conducted in a way that is electrically safe. This duty includes:

- ensuring that all electrical equipment used in the conduct of the person's business or undertaking is electrically safe; and
- if the person's business or undertaking includes the performance of electrical work, ensuring the electrical safety of all persons and property likely to be affected by the electrical work; and
- if the person's business or undertaking includes the performance of work, whether or not electrical work, involving contact with, or being near to, exposed parts, ensuring persons performing the work are electrically safe.

The Electrical Safety Regulation 2013 (ES Regulation) includes more specific requirements for managing electrical risks at the workplace. For example, all persons conducting a business or undertaking have duties in relation to specified electrical equipment, and any unsafe electrical equipment, at the workplace. The ES Regulation also specifies safety switch requirements for certain types of work at a workplace (e.g. for manufacturing work).

Persons conducting a business or undertaking carrying out electrical work must comply with the prohibition on electrical work on energised electrical equipment subject to certain exceptions.

Persons conducting a business or undertaking should ensure electrical installation work is carried out by qualified persons and testing and compliance requirements are met.

TYPES OF ELECTRICAL WORK

Construction Work

The Work Health and Safety Regulation 2011 (WHS Regulation) s289 defines - *construction work* as any work carried out in connection with the construction, alteration, conversion, fitting-out, commissioning, renovation, repair, maintenance, refurbishment, demolition, decommissioning or dismantling of a structure.

The ES Regulation s103-104 defines construction work within the meaning of the WHS Regulation s289, other than amusement work or rural industry work; or work done in conjunction with construction work.

Manufacturing work

The ES Regulation s105-110 defines *manufacturing work* as the work of assembly, disassembly, fabrication, installation, maintenance, manufacturing, refurbishment or repair, but does not include amusement work, construction work or rural industry work.

Service work/ Office work

The ES Regulation s111-113 defines *service work* as work that is not amusement work, construction work, manufacturing work, office work or rural industry work.

Amusement work

The ES Regulation s114 - 118 defines *amusement work* as work, other than work performed by a non-profit organisation, to assemble, operate or disassemble any of the following on the site on which it is used, intended to be used or has been used—

- a) an amusement device or amusement ride;
- b) a thing used to provide amusement activities, including side show activities, associated with—
 - carnivals, fairs or shows; or
 - amusement arcades or similar places;

Rural Industry Work

The ES Regulation s119-120 defines *rural industry work* as work—

- a) in the cultivation of any agricultural crop or product whether or not grown for food; or
- b) in the rearing and management of farm animals; or

Examples of farm animals -
livestock, bees, worms
- c) in the classing, scouring, sorting or pressing of wool; or
- d) that is aquaculture; or
- e) in flower or vegetable market gardens; or

- f) for clearing, fencing, trenching, draining or otherwise preparing land for anything stated in paragraph (a), (b), (d) or (e).

Rural industry work includes work that is construction work, manufacturing work or office work performed for the purposes of an activity mentioned in subsection (1) if—

- a) the work is performed by a person conducting a business or undertaking, or an employee of that person; and
- b) the product of the work is to be used in the business or undertaking; and
- c) the work is performed on premises on which the product of the work is to be used.

Examples of construction work or manufacturing work—

- *repairing farm machinery, including, for example, tractors and implements*
- *making farm machinery, including, for example, cattle crushes, spray booms or fruit picking booms*
- *building sheds*

Rural industry work does not include work to which rural industry work is only incidental.

Examples—

- *work in carrying on a farm stay*
- *work in conducting a tour associated with rural industry work*

ELECTRICAL INCIDENTS AND NOTIFICATIONS

A PCBU must, under the ES Regulation, notify the regulator once they become aware of a serious electrical incident (SEI) or dangerous electrical event (DEE) arising out of the conduct of their business or undertaking.

Serious Electrical Incident

Section 11 of the ES Act defines a Serious electrical incident as an incident involving electrical equipment if, in the incident –

- a) a person is killed by electricity; or
- b) a person received 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 received 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.

What is ‘treatment’?

Examples of treatment may include:

- the application of creams or dressings to burns;
- cleaning and dressing of wounds, cuts or abrasions;
- setting of broken bones or strapping of strains or sprains;
- administering/prescribing of medications.

Once treatment is administered, regardless of the level of treatment, it is reportable.

However treatment does not include periods of precautionary observation or non-invasive monitoring such as an electrocardiogram (ECG).

What is meant by ‘under the supervision of a doctor’?

For the purposes of reporting SEIs, the Electrical Safety Office considers that treatment “under the supervision of a doctor” includes:

- treatment from a registered nurse in hospital or medical centre or treatment from a paramedic under instruction from a doctor regardless of whether a doctor was in attendance when the treatment was administered.

Where a person meets the criteria above, the incident should be reported as an SEI.

High Voltage: Any electric shock or injury received from a high voltage source of electricity must be reported regardless of whether treatment for the shock or injury was received

Dangerous Electrical Event

A dangerous electrical event (DEE) is defined in section 12 of the ES Act and includes:

- when a person, for any reason, is electrically unsafe around high voltage electrical equipment, even if the person doesn't receive an electric shock or injury
- significant property damage caused by electricity or something originating from electricity e.g. electrical fire
- unlicensed electrical work
- unsafe electrical work
- unsafe electrical equipment or electrical equipment that does not have electrical equipment safety system (EESS) approval markings

SPECIFIED ELECTRICAL EQUIPMENT

The ES Regulation s97 defines *Special electrical equipment* as -

- 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

Examples of specified electrical equipment used to perform manufacturing work—

- a hand held grinder plugged into a socket-outlet
- a hand held electric drill plugged into a socket-outlet that is used for drilling holes in steelwork in a light engineering workshop

Examples of specified electrical equipment used to perform service work –

- a portable vacuum cleaner used in a hotel
- a hand held blow dryer used in a hairdressing salon

Examples of specified electrical equipment used to perform office work –

- a power board or extension lead used to supply power to office equipment

TESTING AND TAGGING OF ELECTRICAL EQUIPMENT

Specified electrical equipment and safety switches need to be tested at intervals according to their class of work. For construction work this information is in AS/NZS 3760:2010 *In-service safety inspection and testing of electrical equipment*.

For manufacturing, service, office, amusement and rural industry work, the information is in the ES Regulation.

Only a person appointed as competent can test and tag electrical equipment. Competence is based on knowledge and skills gained from training, experience, qualifications or a combination of these.

ELECTRICAL TESTING AND TAGGING CRITERIA FOR TYPES OF ELECTRICAL WORK

The following table is an extract from AS/NZS 3760; 2010 – IN-SERVICE SAFETY INSPECTION AND TESTING OF ELECTRICAL EQUIPMENT:

Intervals for testing

The class of work determines how often specified electrical equipment and safety switches are tested

Class of work	Portable/specified electrical equipment	Type 1 or 2 safety switch (fixed)	Type 1 or 2 safety switch (portable)
Construction work	At least 3 monthly intervals by a competent person	- Use the inbuilt test button (at least monthly) - An operating time/current test by a competent person at least annually	- Use the inbuilt test button – immediately after it is connected and immediately before it used, first time each day - By a competent person, at least every 3 months
Manufacturing work	- If equipment is double insulated, at least every 12 months by competent person - If not double insulated, at least every 6 months by competent person and connected to a safety switch	- Use the inbuilt test button – at least every 6 months - An operating time/current test at least every 12 months by competent person	- Use the inbuilt test button – daily or before each use, whichever is longer - By a competent person, at least every 12 months Note: From 1 March 2008, portable safety switches are not to be used in manufacturing work. Installed safety switches must be used
Service work	At least 12 monthly intervals by a competent person or connected to a safety switch	- Use the inbuilt test button, at least every 6 months - An operating time/current test by a competent person, at least every 12 months	- Use the inbuilt test button at least every 3 months or before each use, whichever is longer - An operating time/current test by a competent

		Longer test intervals may apply. Consult the Electrical Safety Regulation 2013 and AS/NZS 3760 In-service safety inspection and testing of electrical equipment	person, at least every 12 months Longer test intervals may apply. Consult the Electrical Safety Regulation 2013 and AS/NZS 3760 In-service safety inspection and testing of electrical equipment
Office work	At least 5 yearly intervals by a competent person or connected to a safety switch	- Use the inbuilt test button at least every 6 months - An operating time/current test by a competent person, at least every 2 years	- Use the inbuilt test button at least every 3 months - An operating time/current test by a competent person at least every 2 years
Amusement work (specified electrical equipment)	- If equipment is double insulated, at least every 12 months by competent person - If not double insulated, at least 6 months by competent person and connected to a safety switch	- Use the inbuilt test button – at least every 3 months - An operating time/current test at least every 6 months by competent person - Longer test intervals may apply. Consult the Electrical Safety Regulation 2013	- Use the inbuilt test button – daily or before each use, whichever is longer - By a competent person, at least every 3 months - Longer test intervals may apply. Consult the and AS/NZS 3760 In-service safety inspection and

		and AS/NZS 3760 In-service safety inspection and testing of electrical equipment	testing of electrical equipment
Amusement work (amusement rides and devices)	Inspected and tested each after each onsite assembly, and every six months		
Rural industry work (all plug in equipment)	Visual examination before each use		
Rural industry work (Specified electrical equipment used under stated electrical risk factors)	Either: test and inspect every 12 months or protect with a safety switch	Recommended push button test every three months	Recommended push button test every three months

For construction work, refer to [AS/NZS 3012 Electrical Installations – Construction and demolition sites](#).

For all other work, refer to the [Electrical Safety Regulation 2013](#).

Equipment that fails testing should be immediately taken out of use and a durable tag must be attached warning people not to use equipment.

If the equipment is safe you must attach a durable tag which shows when the next test is due.

REQUIREMENT TO USE AND TEST A RESIDUAL CURRENT DEVICE IN THE VARIOUS TYPES OF WORK

The ES Regulations refer to AS/NZS 3760; 2010 which provides direction on the intervals for the testing of Safety Switches.

Construction work:

A fixed safety switch must be tested as follows:

- Use the inbuilt test button (at least monthly)
- An operating time-current test by a competent person

A portable safety switch must be tested as follows:

- Use the inbuilt test button – immediately after it is connected and immediately before it used, first time each day
- By a competent person, at least every 3 months

Manufacturing work:

A fixed safety switch must be tested as follows:

- Use the inbuilt test button – at least every 6 months
- An operating time/current test at least every 12 months by competent person

A portable safety switch must be tested as follows:

- Use the inbuilt test button – daily or before each use, whichever is longer
- By a competent person, at least every 12 months

Service work:

A fixed safety switch must be tested as follows:

- Use the inbuilt test button, at least every 6 months
- An operating time/current test by a competent person, at least every 12 months

A portable safety switch must be tested as follows:

- Use the inbuilt test button at least every 3 months or before each use, whichever is longer
- An operating time/current test by a competent person, at least every 12 months

Office work:

A fixed safety switch must be tested as follows:

- Use the inbuilt test button at least every 6 months
- An operating time/current test by a competent person, at least every 2 years

A portable safety switch must be tested as follows:

- Use the inbuilt test button at least every 3 months
- An operating time/current test by a competent person at least every 2 years

Amusement work:

A fixed safety switch must be tested as follows:

- Use the inbuilt test button – at least every 3 months
- An operating time/current test at least every 6 months by competent person

A portable safety switch must be tested as follows:

- Use the inbuilt test button – daily or before each use, whichever is longer
- By a competent person, at least every 3 months

Rural industry work:

Recommended push button test every three months.

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