

<b>Title</b>	<b>Demonstrate knowledge of workplace safety in an electrotechnology or telecommunications environment</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	<p>This unit standard is not intended for use by electricians. It is designed to meet the requirements of workplace safety and workplace hazard management for technicians working in an electrotechnology or telecommunications environment and includes first-time tuition for the issue of a Trainee Limited Certificate for electrical workers as required by the Electrical Workers Registration Board.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>– explain the hazardous nature of electricity;</li> <li>– demonstrate elementary knowledge of the Health and Safety at Work Act 2015 in relation to working in an electrotechnology or telecommunications environment;</li> <li>– demonstrate knowledge of the safety management of workplace hazards in an electrotechnology or telecommunications environment;</li> <li>– explain general safety practices in an electrotechnology or telecommunications environment;</li> <li>– demonstrate knowledge of special hazards and fire hazards specific to an electrotechnology or telecommunications environment;</li> <li>– demonstrate knowledge of safe use of tools and test equipment in an electrotechnology or telecommunications environment;</li> <li>– demonstrate knowledge of rules, procedures, and use of instruments to ensure the continued safety of electrotechnology or telecommunications technicians;</li> <li>– demonstrate knowledge of initial response to an accident involving electricity that applies to persons working in an electrotechnology or telecommunications environment; and</li> <li>– analyse industry-relevant incidents.</li> </ul>
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<b>Classification</b>	Electrical Engineering > Electrotechnology
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 This unit standard has been developed for learning and assessment off-job.

- 2 The Electricity Amendment Act 2006 empowers the Electrical Workers Registration Board (EWRB) to make rules pertaining to electrical regulation. The Rules of the Board carry the same authority as Regulations and must be adhered to.
- 3 In order for a person to be eligible for a Trainee Limited Certificate (TLC), training and assessment for performance criterion 8.1 and performance criterion 8.2 of this unit standard must be carried out by an EWRB approved provider. A list of EWRB approved Providers is available at: <https://www.ewrb.govt.nz>.
- 4 References  
AS/NZS 3760:2010, *In-service safety inspection and testing of electrical equipment*, including Amendment 1 and 2;  
AS/NZS 4836:2011, *Safe working on or near low-voltage electrical installations and equipment*;  
AS/NZS 60479.1:2010, *Effects of current on human beings and livestock - General aspects*;  
AS/NZS 3000:2007, *Electrical installations (known as the Australia/New Zealand Wiring Rules)*, including Amendment 1 and 2;  
CPRL2 Guidelines – refers to requirements of the New Zealand Resuscitation Council as referred to in the EWRB *Guidelines for delivery of approved competence programmes for persons wishing to uplift practising licenses*:  
<https://www.ewrb.govt.nz>;  
Electricity Act 1992;  
Electricity (Safety) Regulations 2010;  
Health and Safety at Work Act 2015;  
Electrical Workers Registration Board – Guideline, *Supervision Procedures for Trainees* available at: <https://www.ewrb.govt.nz>;  
Electrical Workers Registration Board – Rule of the Board, *Essential Capabilities for Electrical Registration* available at: <https://www.ewrb.govt.nz>;  
New Zealand Resuscitation Council (NZRC) guidelines on CPR – available from <http://www.nzrc.org.nz>;  
and all subsequent amendments and replacements.
- 5 Definitions  
*CPR* – Cardiopulmonary resuscitation.  
*Current regulations and standards* – in this unit standard this term is used to refer to the requirements of the above references.  
*EWRB* – Electrical Workers Registration Board.  
*Industry practice* – those practices that competent practitioners within the industry recognise as current industry best practice.  
*PPE* – Personal Protective Equipment.  
*Prove-test-prove* – this method refers to proving the instrument before and after a test to ensure that it works properly, and is particularly important when confirming electrical isolation. Some instruments have fused leads and may give false indication of isolation if the fuse is open circuit or blows during the test. Proving is done by applying the instrument to a circuit that is known to be energised and observing the measured voltage, testing the circuit to be isolated to ensure it is in fact isolated, then proving the instrument again on a circuit that is known to be energised.

## 6 Range

- a Candidates must refer to current legislation and Standards during assessment.
- b All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
  - i legislation;
  - ii policies and procedures;
  - iii ethical codes;
  - iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
  - v applicable site, enterprise, and industry practice;
  - vi where appropriate, manufacturers' instructions, specifications, and data sheets.

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## Outcomes and performance criteria

### Outcome 1

Explain the hazardous nature of electricity.

#### Performance criteria

- 1.1 Explain the nature of electric shock in terms of how it may arise, its physiological effect, and the effects of voltage and current on the human body as described by AS/NZS 60479.
- 1.2 Explain the hazards of short circuits and uncontrolled fault currents in terms of the risk of fire and/or other damage to persons and property.
- 1.3 Explain the potential for harm from step, touch and rising voltages.

### Outcome 2

Demonstrate elementary knowledge of the Health and Safety at Work Act 2015 in relation to working in an electrotechnology or telecommunications environment.

#### Performance criteria

- 2.1 Briefly outline the scope, coverage, and object of the Health and Safety at Work Act 2015.
- 2.2 Briefly outline the enforcement of the Health and Safety at Work Act 2015.  
  
Range        inspector functions, rights of entry, issue of notices.
- 2.3 Explain the duties of PCBU's, officers and workers in terms of the Health and Safety at Work Act 2015.

### Outcome 3

Demonstrate knowledge of the safety management of workplace hazards in an electrotechnology or telecommunications environment.

**Performance criteria**

- 3.1 Explain the principles of a health and safety risk assessment and control measures.
- Range risk assessment – identifying hazards, assessing and prioritising risks, applying control measures;  
control measures – eliminate, minimise, personnel training.
- 3.2 Identify persons responsible for safety of electrical workers, and outline the principles of supervision of apprentices and/or trainees in accordance with the EWRB – Guideline, *Supervision Procedures for Trainees*.
- 3.3 Identify the need for all electrical work to be performed by competent personnel in accordance with current regulations and standards.
- 3.4 Explain the warning and reporting procedures of unsafe situations in the workplace in accordance with current regulations, standards, and company practice.
- Range hazard, incident, near miss.
- 3.5 Identify control measures to eliminate or minimise workplace hazards for given situations.
- Range may include but is not limited to – system isolation, switching off, isolating supply, locking-off and tagging of isolators, disconnecting load side of isolator, proving supply is dead by testing, precautions when leaving unfinished work, precautions for working on live equipment, safety distances, personnel training, safety rules, insulating area, access control, inspection and testing of tools and equipment, hazard control plans, inspection of PPE before use, use of observers;  
evidence of all relevant control measures for given situations.

**Outcome 4**

Explain general safety practices in an electrotechnology or telecommunications environment.

## Performance criteria

4.1 Explain aspects of worker behaviour that promote safety in the workplace.

Range worker behaviour may include but is not limited to – carrying out instructions properly, asking if in doubt, reporting unsafe conditions, using only correct and approved tools and equipment, not distracting others, only using machinery when trained and authorised to do so, obeying all safety rules and signs, not wearing loose or torn clothing, wearing of metallic items, taking necessary precautions to ensure that the workplace is safe when members of the public are present as they may not be aware of hazards; evidence of three examples is required.

4.2 Explain good housekeeping practices that reduce hazards and risks.

Range good housekeeping practices includes but are not limited to – cleaning up at intervals during the day; not allowing rubbish to accumulate; keeping the floor, aisles and passageways clear of obstructions; keeping fire exits and equipment clear of obstructions; storing tools and equipment in the correct place; evidence of three examples is required.

4.3 Explain safety practices relating to working at height.

Range working at heights may include but is not limited to – working on or with ladders, working platforms, scaffolding, cherry pickers, rooftops;  
safety practices may include but are not limited to – PPE, PPE and equipment limitations, safety analysis, task analysis, rescue plan, rescue procedure, requirements when working above three metres.

4.4 Explain PPE in terms of function of each item, the circumstances where PPE should be used, and inspection requirements.

Range PPE includes but is not limited to – eye protection, head protection, hand protection, hearing protection, foot protection, fall arrest equipment, UV protection, clothing, rubber mats; may include – breathing apparatus.

## Outcome 5

Demonstrate knowledge of special hazards and fire hazards specific to an electrotechnology or telecommunications environment.

**Performance criteria**

5.1 Identify harmful effects and typical occurrences of special hazards.

Range special hazards may include but are not limited to – infrared, ultraviolet, laser, radio waves, microwaves, electrostatic and electromagnetic fields, chemicals, gases, dusts, asbestos, traffic, confined spaces, excavations, operating machinery; elevated temperatures; height.

5.2 Outline methods used to control special hazards.

Range special hazards may include but are not limited to – infrared, ultraviolet, laser, radio waves, microwaves, electrostatic and electromagnetic fields, chemicals, gases, dusts, asbestos, traffic, confined spaces, excavations, operating machinery; elevated temperatures; height.

5.3 Outline personal safety requirements related to special hazards.

Range special hazards may include but are not limited to – infrared, ultraviolet, laser, radio waves, microwaves, electrostatic and electromagnetic fields, chemicals, gases, dusts, asbestos, traffic, confined spaces, excavations, operating machinery; elevated temperatures; height; personal safety may include but is not limited to – validation of test equipment operation, equipment calibration, training.

5.4 Identify components of the fire tetrahedron required to sustain combustion in relation to fires.

5.5 Outline methods in relation to the fire tetrahedron used in controlling combustion and related to extinguishing fires.

5.6 Identify extinguishants in relation to the types of fires that they are suitable for and not suitable for.

Range extinguishants – water, foams, wet chemicals, dry powders, vaporizing liquids, carbon dioxide; fire types – fire classes A, B, C, D, E, and F.

5.7 Outline personal safety requirements related to fires, extinguishants, and extinguishing methods.

**Outcome 6**

Demonstrate knowledge of safe use of tools and test equipment in an electrotechnology or telecommunications environment.

**Performance criteria**

- 6.1 Explain general principles relating to safe use of tools and test equipment.  
Range inspection, storage and transportation, routine testing.
- 6.2 Identify indications that tools and test equipment are in poor condition.
- 6.3 Explain the need for insulated tools to be rated and manufactured to an approved standard.

**Outcome 7**

Demonstrate knowledge of rules, procedures, and use of instruments to ensure the continued safety of electrotechnology or telecommunications technicians.

**Performance criteria**

- 7.1 Explain the principles, procedures, reasons, and techniques used to test for electrical safety.  
Range principles – test-before-touch, prove-test-prove.
- 7.2 Outline the practices and limitations relating to the use of test instruments.
- 7.3 Demonstrate the use of test instruments.  
Range practical demonstration includes – selection of instruments, performing tests, interpreting measurements or indications.
- 7.4 Demonstrate knowledge of safety and test procedures in relation to electrical wiring, fittings, and single-phase appliances.  
Range practical demonstration includes – checks and tests to prove isolation, tests to ensure compliance and absence of unsafe conditions, safety procedures for working on single-phase appliances;  
single-phase appliances – plug-in, fixed wired.
- 7.5 Identify potential hazards from the use of specialist equipment used for testing purposes.  
Range may include but is not limited to – insulation resistance testers (IRT), current injection test sets, radio frequency (RF) generators, light sources, high voltage power supplies, air compressors, pressure gauges;  
evidence of two items of specialist equipment is required.

**Outcome 8**

Demonstrate knowledge of initial response to an accident involving electricity that applies to persons working in an electrotechnology or telecommunications environment.

## Performance criteria

- 8.1 Explain the fundamental principles of rescuing a person from live conductors and equipment with reference to the requirements of EWRB 'Rules of the Board' *Essential Capabilities for Electrical Registration*.
- 8.2 Demonstrate initial response in an emergency for a victim of an accident involving electricity in accordance with CPRL2 guidelines and with reference to the requirements of EWRB *Essential Capabilities for Electrical Registration*.
- 8.3 Explain the requirements for non-interference with the scene of an electrical accident in accordance with the requirements of the Health and Safety at Work Act 2015 and the Electricity Act 1992.
- 8.4 Explain the requirements for recording and reporting an accident in accordance with the requirements of the Health and Safety at Work Act 2015 and/or the Electricity Act 1992.

## Outcome 9

Analyse industry-relevant incidents.

Range a minimum of three case studies relevant to the industry, one of which resulted in the death of a person.

## Performance criteria

- 9.1 Examine case studies and draw conclusions as to the cause of the accident and the extent and nature of the damage resulting from the incident.
- 9.2 Identify fundamental errors made that led to the incident in terms of dangerous practices, testing procedures not followed, and general safety measures not taken.

<b>Replacement information</b>	This unit standard replaced unit standard 17396 and unit standard 17490.
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<b>Planned review date</b>	31 December 2027
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## Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 July 2013	31 December 2022
Review	2	14 December 2017	31 December 2024
Review	3	2 March 2023	N/A



<b>Consent and Moderation Requirements (CMR) reference</b>	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

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### Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at [qualifications@waihangaararau.nz](mailto:qualifications@waihangaararau.nz) if you wish to suggest changes to the content of this unit standard.