

<b>Title</b>	<b>Demonstrate knowledge of the Electricity Act, circuit protection and compliance testing of works or installations</b>		
<b>Level</b>	<b>5</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	<p>People credited with this unit standard are able to demonstrate knowledge of:</p> <ul style="list-style-type: none"> <li>• legislation, codes of practice, standards, classes of registration, prescribed electrical work (PEW) and limits of work for a registered electrical worker</li> <li>• AS/NZS 3000 as applied to electrical works and installations undertaken in the electricity supply sector</li> <li>• circuit protection terms and principles and circuit protection devices</li> <li>• inspection, testing, and certification requirements for electrical installations</li> <li>• tests required for electrical compliance.</li> </ul> <p>This unit standard is intended for Electricity Supply Industry Power Technicians who hold higher academic qualifications such as degrees and diplomas in electrical engineering, who wish to obtain Electrical Workers Registration Board (EWRB) registration under the electrical engineer's class of registration.</p>
----------------	--

<b>Classification</b>	Electricity Supply > Electricity Supply - Power System Maintenance
-----------------------	--

<b>Available grade</b>	Achieved
------------------------	----------

---

### Guidance Information

- 1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements.

- 2 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to:
- Electricity Act 1992
  - Electricity (Safety) Regulations 2010
  - Health and Safety at Work Act 2015
  - Electricity supply industry codes of practice and documented enterprise procedures, including *Safety Manual – Electricity Industry (SM-EI)* and relevant EEA guides available at [www.eea.co.nz](http://www.eea.co.nz)
  - AS/NZS 3000:2018 *Electrical installations* (known as the Australian/New Zealand Wiring Rules)
  - AS/NZS 3760:2022 *In-service safety inspection and testing of electrical equipment*
  - Electrical Workers Registration Board, *Supervision Procedures for Trainees*, (2010) available at [EWRB - Publications](#)
- and any subsequent amendments and replacements.
- 3 Definitions
- ELCB* – earth-leakage circuit-breaker.  
*GFI* – ground-fault interrupter.  
*PEW* – prescribed electrical work.  
*RCCB* – residual current-operated circuit breaker.  
*RCBO* – residual current-operated circuit breaker with overcurrent protection.

---

## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of legislation, codes of practice, standards, classes of registration, PEW and limits of work for a registered electrical worker.

### Performance criteria

- 1.1 Key standards applicable to the work of registered electrical workers are identified.
- Range AS/NZS 3000, AS/NZS 3760.
- 1.2 The structure of the Electricity (Safety) Regulations in terms of the relationship between it, the Act, other regulations, codes of practice, and standards is described.
- 1.3 The requirements for supervision of trainees and other electrical workers who are not permitted to carry out PEW are described, in accordance with *Supervision Procedures for Trainees*.
- 1.4 The requirements to obtain a Trainee Limited Certificate and the limitations of work for a person with a Trainee Limited Certificate are identified and described.
- 1.5 The requirements for a person to be registered with EWRB, limits of work according to classes of registration, and responsibilities as a licenced electrical worker are explained.

1.6 PEW that electrical workers may perform is defined, and responsibilities in doing so are described.

Range responsibilities – compliance with current regulations and standards as they apply to the work undertaken, high standard of work, safe working practices, certification of PEW.

1.7 Electrical work requiring inspection is outlined and persons qualified to inspect such work are identified.

## Outcome 2

Demonstrate knowledge of AS/NZS 3000 as applied to electrical works and installations undertaken in the electricity supply sector.

### Performance criteria

2.1 The structure of AS/NZS 3000 is described in terms of clauses that are mandatory and those that are only a means of compliance.

2.2 The fundamental safety requirements contained in AS/NZS 3000 in terms of protection of people, plant and equipment and property are described.

2.3 The testing and verification of electrical work as prescribed in AS/NZS 3000 is explained.

## Outcome 3

Demonstrate knowledge of circuit protection terms and principles and circuit protection devices.

### Performance criteria

3.1 The relationship between fusing or tripping current, current rating, and fusing or tripping factor for a protective device is stated.

3.2 The merits of providing close excess-current protection are explained.

3.3 The effects of electrical faults are described in terms of the danger to people and property.

Range faults – leakage current, over current, short circuit;  
effects – electromechanical energy, heat energy, damaged cables and equipment, fire, explosion, electric shock.

3.4 Protection devices are described with the aid of diagrams and reference to construction and operating principles.

Range devices – rewirable, cartridge and high rupturing capacity fuses, miniature circuit-breaker, fusible links.

- 3.5 Fuse cartridge type, classification and size are identified from physical or graphical representations of cartridge markings.
- Range three different fuse cartridges.
- 3.6 The effects of poor co-ordination and discrimination of protective devices for fault isolation are described.
- 3.7 Terminology used to describe types of residual current detectors is identified and operating function described.
- Range ELCB, RCCB, RCBO, GFI.
- 3.8 One type of residual current detector is described with reference to its construction and principle of operation.
- Range ELCB, RCCB, RCBO, GFI.
- 3.9 Procedure for testing the operation of one type of residual current detector is described and demonstrated.
- Range operating time, residual trip current.

#### **Outcome 4**

Demonstrate knowledge of inspection, testing, and certification requirements for electrical installations.

#### **Performance criteria**

- 4.1 Testing requirements for prescribed electrical work are identified.
- 4.2 Certification requirements for registered electrical workers carrying out prescribed electrical work are described.
- 4.3 Work that requires inspection by a registered electrical inspector is identified.

#### **Outcome 5**

Demonstrate knowledge of tests required for electrical compliance.

#### **Performance criteria**

- 5.1 Types of compliance tests carried out on electrical installations, or works, or electrical equipment are explained.
- Range visual compliance, earth continuity, protective earthing, bonding conductors, fault loop impedance, insulation resistance, polarity, correct circuit connections, operation of residual current devices, functional testing of electrical equipment.

<b>Planned review date</b>	31 December 2025
----------------------------	------------------

#### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 July 2017	N/A
Rollover and Revision	2	2 March 2023	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0120
--	------

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

#### 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.