Title	**Apply knowledge of electrical safety and safe working practices for electrical workers**		
Level	**3**	**Credits**	**6**

Purpose	The purpose of this unit standard is to meet the requirements of first-time tuition in safe working practices for electrical workers as required by the Electrical Workers Registration Board. People credited with this unit standard are able to: – demonstrate knowledge of the hazardous nature of electricity; – demonstrate elementary knowledge of the Health and Safety at Work Act; – demonstrate knowledge of the safety management of electrical hazards; – demonstrate knowledge of general safety practices in the workplace; – demonstrate knowledge of special hazards; – demonstrate knowledge of safe use of tools and test equipment; – analyse electrical incidents; – describe safety and emergency procedures, equipment, and known hazards in the electrical workplace; and – demonstrate knowledge of fire safety.

Classification	Electrical Engineering > Core Electrical

Available grade	Achieved

Guidance Information

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

2 This unit standard meets the assessment requirements of ERAC CEPCs 2, 46, and 48.
This unit standard and unit standards 5932, 15848, 15855, 17602, and 29480 meet the assessment requirements of ERAC CEPCs 10.
This unit standard and unit standards 17602, and 29478 together meet the assessment requirements of ERAC CEPCs 42.
This unit standard and unit standards 17602 and 29468 together meet the assessment requirements of ERAC CEPC 43.
This unit standard and unit standard 17602 together meet the assessment requirements of ERAC CEPC 44.
This unit standard and unit standards 29421, and 29479 together meet the assessment requirements of ERAC EPC 45.

This unit standard and unit standards 29423, and 29467 together meet the assessment requirements of ERAC EPC 49.

3 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.

4 Definitions
CEPC – Critical Essential Performance Capabilities.
EPC – Essential Performance Capabilities.
ERAC – Electrical Regulatory Authorities Council.
EWRB – Electrical Workers Registration Board.
Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
PPE – (Personal protective clothing and equipment) includes – overalls, safety footwear, gloves, gauntlets, waterproof gear, eye protectors; and may include but is not limited to – head protectors, hearing protectors, breathing apparatus.
Safe and sound practice – as it relates to the installation of electrical equipment is defined in AS/NZS 3000:2007, *Electrical Installations (known as the Australian/New Zealand Wiring Rules).*

5 References
AS/NZS 3000:2007, *Electrical Installations (known as the Australian/New Zealand Wiring Rules)*;
AS/NZS 3760: 2010, *In-service safety inspection and testing of electrical equipment*;
AS/NZS 60479.1:2010, Effects of current on human beings and livestock - General aspects
Electricity (Safety) Regulations 2010;
Electricity Act 1992;
Health and Safety at Work Act 2015;
The New Zealand Electrical Codes of Practice (Ministry of Economic Development, ISSN 0114-0663);
and all subsequent amendments and replacements.

6 For coverage of knowledge of safety relating portable tools and appliances refer to unit standard 15848.
For coverage of knowledge and skills relating to in-service safety inspection and testing of electrical equipment in accordance with AS/NZS 3760 refer to unit standard 6705.

7 The *prove-test-prove* 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.

8 Range
a Candidates may refer to current legislation and Standards during assessment.
b Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.

c 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; and,
   vi where appropriate, manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of 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, the effects of voltage, and the effects of current on the human body as described by Figure 14 of AS/NZS 60479.1.

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.

Outcome 2

Demonstrate elementary knowledge of the Health and Safety at Work Act.

Performance criteria

2.1 Provide an outline of the scope, coverage, and objective of the Act.

2.2 Provide an outline of how the Act is enforced.

2.3 In terms of the Act provide meanings for PCBU, officer, worker, workplace, supply, reasonably practicable, notifiable injury or illness, notifiable incident, notifiable event.

2.4 Describe employers' responsibilities under the Act.

2.5 Describe employees' rights and responsibilities under the Act.

2.6 Give the Act's definition of hazards and provide four examples.

2.7 Describe emergency procedures, training, employee participation, incident and hazard reporting, hazard management procedures.

2.8 Outline hazard hierarchy and control measures in terms of elimination or minimising hazards and give two examples of each.

Outcome 3

Demonstrate knowledge of the safety management of electrical hazards.

Performance criteria

3.1 Explain the principles of risk assessment and control measures.

Range risk assessment – identifying hazards, assessing risks and prioritising responses, applying control measures, personnel training.

3.2 Identify persons responsible for safety of electrical workers, and outline the principles of supervision of apprentices and trainees in accordance with the Electrical Workers Registration Board (EWRB) *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 and Standards.

3.5 Identify control measures to eliminate or minimise electrical hazards.

Range may include but is not limited to – 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 equipment that could be live, safety distances, personnel training, safety rules, insulating area, access control, inspection and testing of tools and equipment, inspection of clothing;
electrical hazards include but are not limited to – high current, high voltage, low voltage.

3.6 Outline safety requirements to be observed for systems operating at 11 kV and above.

Outcome 4

Demonstrate knowledge of general safety practices in the workplace.

Performance criteria

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

Range worker behaviour may include but is not limited to – carrying out hazard assessment and emergency plan prior to work commencing, carrying out instructions properly, asking if in doubt, reporting unsafe conditions, using correct tools and equipment, keeping the workplace clean and tidy, not distracting others, wearing or using protective clothing and equipment provided, only using machinery if authorised and competent to do so, obeying all safety rules and signs, using only authorised tools and equipment, keep worksite tidy, not wearing loose or torn clothing, taking extra care when members of the public are present as they may not be aware of hazards.

4.2 Describe good housekeeping practices that reduce hazards and risks.

Range may include but is 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, maintaining awareness of working environment such as uneven surfaces and air quality.

4.3 Describe safety practices relating to working at height and outline care and maintenance requirements of equipment.

Range ladders, working platforms, scissor lifts, scaffolding, cherry pickers, harnesses.

4.4 Outline requirements for working in confined spaces.

4.5 Outline the requirements and responsibilities when working with other trades including the need for community, tailgate, or toolbox meetings.

4.6 Lead a community, tailgate, or toolbox meeting.

4.7 Describe the potential long-term effects of ill health and injuries on yourself, your family, your workplace, and the wider community.

Outcome 5

Demonstrate knowledge of special hazards.

Range special hazards – infrared, ultraviolet, radio waves, microwaves, electrostatic and electromagnetic fields, air quality, chemicals, gases, dusts, asbestos.

Performance criteria

5.1 Identify special hazards, their harmful effects, and typical occurrences.

5.2 Outline the function of material data sheets.

5.3 Outline the requirements of the correct disposal of hazardous materials.

5.4 Summarise precautions to observe when encountering special hazards.

Outcome 6

Demonstrate knowledge of safe use of tools and test equipment.

Performance criteria

6.1 Explain general principles relating to safe use of tools and test equipment.

Range regular inspection of hand tools, routine testing of electrical tools against AS/NZS 3760, features and ratings of test equipment for use on live circuits.

6.2 Identify signs that show tools and test equipment are in poor condition.

6.3 Use tools in accordance with manufactures' instructions and safe operating procedures.

6.4 Practically demonstrate the prove-test-prove method.

Outcome 7

Analyse electrical incidents.

Range at least three case studies of electrical incidents, one of which resulted in the death of an electrical worker.

Performance criteria

7.1 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.

7.2 Identify fundamental errors that led to the incident in terms of hazardous practices, testing procedures not followed, and general safety measures not taken.

Outcome 8

Describe safety and emergency procedures, equipment, and known hazards in the electrical workplace.

Performance criteria

8.1 Describe PPE in terms of the function of each component.

8.2 Describe the correct use and maintenance of PPE in accordance with manufacturers' instructions.

8.3 Describe the procedures for accident and/or incident reporting.

8.4 Describe emergency procedures.

8.5 Wear appropriate PPE at all times in electrical workplaces.

8.6 Identify known hazards and describe the potential dangers.

Outcome 9

Demonstrate knowledge of fire safety.

Performance criteria

9.1 Describe the fire triangle.

9.2 Outline fire extinguisher types and state the fuels each is intended for.

9.3 Explain how to and when to use fire extinguishers.

9.4 Define a fire cell and describe how the design of an installation can reduce the spread of fire.

9.5 Outline automatic fire extinguisher systems, their purpose, and operation.

Replacement information	This unit standard replaced unit standard 15851.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 July 2016	31 December 2027
Review	2	25 May 2023	31 December 2027

Consent and Moderation Requirements (CMR) reference	0003

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