

<b>Title</b>	<b>Demonstrate and apply knowledge of safe plant isolation, re-commissioning, and associated electrical testing procedures</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	<p>This unit standard is intended for use in the training of electrical workers and covers a basic understanding of electrical plant isolation and testing.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>– demonstrate knowledge of plant isolation requirements in terms of electrical and mechanical appliances;</li> <li>– demonstrate knowledge of electrical and mechanical plant isolation procedures;</li> <li>– demonstrate knowledge of methods of connecting appliances to the electricity supply;</li> <li>– demonstrate knowledge of plant re-commissioning; and</li> <li>– develop a basic isolation and re-commissioning plan.</li> </ul>
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<b>Classification</b>	Electrical Engineering > Electrical Installation and Maintenance
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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 This unit standard and unit standards 2021, 17602, and 29478 together meet the assessment requirements of ERAC CEPCs 26.  
This unit standard and unit standards 15852, and 29421 together meet the assessment requirements of ERAC CEPCs 31.  
This unit standard and unit standards 17602, 29429, and 29465 together meet the assessment requirements of ERAC CEPCs 43.  
This unit standard and unit standards 15866, and 29427 together meets the assessment requirements of ERAC CEPCs 50.
- 3 Definitions  
*Appliance* – any electrical appliance, other than a lamp, that uses, or is designed or intended to use, electricity, whether or not it also uses, or is designed or intended to use, any other form of energy.  
*CEPC* – Critical Essential Performance Capability.  
*EPC* – Essential Performance Capability.  
*ERAC* – Electrical Regulatory Authorities Council.  
*Industry practice* – those practices that competent practitioners within the industry recognise as current industry best practice.  
*PPE* – personal protective equipment.

*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)*.

- 4 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.
- 5 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.

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## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of plant isolation requirements in terms of electrical and mechanical appliances.

#### Performance criteria

- 1.1 Provide reasons for plant isolation.
- 1.2 Identify required PPE to be used when carrying out plant isolation.
- 1.3 Describe types of electrical equipment that need to be isolated.
- 1.4 Describe types of mechanical equipment that need to be isolated.

### Outcome 2

Demonstrate knowledge of electrical and mechanical plant isolation procedures.

#### Performance criteria

- 2.1 Explain the difference between switching an electrical appliance off and isolating an electrical appliance.

2.2 Describe four commonly used methods of achieving continued isolation.

Range may include but is not limited to – tripping of circuit breaker, removal of fuses, lock-off isolation switch, removal of plug from socket, disconnection of circuit conductors by a registered person, personal locks, warning tags.

2.3 Identify switches that are not acceptable as isolating devices and state the reasons as to why they are unacceptable.

Range includes but is not limited to – push button switches, switches on control stations, emergency stop buttons.

2.4 Describe test method and instruments used to establish that the supply is disconnected.

Range instruments – volt meter or solenoid type voltage tester, rated for 450 volts or more;  
method – test before touch, prove-test-prove, test each phase to earth, test between phases, visually check to ensure that all contacts have opened.

2.5 Describe four possible actions that could result in ineffective isolation.

Range may include but is not limited to – wrong circuit isolated, wrong isolation device operated, damaged insulation between different circuits, appliance supplied from two sources, isolation device not in the phase conductor, unreliable indicator lamps, not all phases of a polyphase appliance are isolated, inoperative test instrument used.

2.6 Describe four consequences of incorrect isolation procedures.

Range may include but is not limited to – electric shock through failure to isolate correct circuit, electric shock through failure to isolate all live conductors, disruption to equipment operation and possible injury through isolating wrong circuit, damage or injury through removing a fuse that is still carrying current.

2.7 Identify two fittings that may still be live after having been switched off.

Range may include but is not limited to – ceiling rose, thermostat, control sensor, control wiring.

2.8 Explain the need to keep the person in charge informed of the reason for, the extent of, and estimated duration of the work, and tell them when the equipment is to be re-energised.

### Outcome 3

Demonstrate knowledge of methods of connecting appliances to the electricity supply.

**Performance criteria**

- 3.1 Explain the terms electrical appliance and electrical fitting.
- 3.2 Explain why appliances must be connected in a parallel configuration.
- 3.3 Describe one method of connection, and the application.

Range may include but is not limited to – flexible cord using approved plugs and sockets, flexible cord from a ceiling rose, flexible cord or cable from connectors in an approved box, switch, or terminal unit, or from a purpose built connecting unit, direct connection of the fixed wiring cables to the electrical appliance terminal box; applications – portability of the apparatus, moist environment, vibration, special tariff circuits, unusually high loading, multi-phase requirements.

**Outcome 4**

Demonstrate knowledge of plant re-commissioning.

**Performance criteria**

- 4.1 Describe procedures to follow and precautions to observe when re-commissioning electrical and mechanical plant.
- 4.2 Give reasons for the procedures and precautions.
- 4.3 Explain re-commissioning test procedures and outline expected test results.

**Outcome 5**

Develop a basic isolation and re-commissioning plan.

**Performance criteria**

- 5.1 Explain the need for a basic isolation and re-commissioning plan.
- 5.2 Draft a basic isolation and re-commissioning plan for a given plant including the reasons for the stated sequences.

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**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
Revision	2	16 March 2017	31 December 2027
Review	3	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>.