

<b>Title</b>	<b>Demonstrate and apply knowledge of special power supplies</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>3</b>

<b>Purpose</b>	People credited with this unit standard are able to demonstrate: <ul style="list-style-type: none"> <li>– knowledge of UPS systems;</li> <li>– knowledge of standby generator sets;</li> <li>– and apply knowledge of switching power supplies; and</li> <li>– knowledge of renewable energy power supply systems.</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, 29419, and 29478 meet the assessment requirements of ERAC EPCs 29.  
 This unit standard and unit standards 5926, 29422, 29471, 29475, and 29481 meet the assessment requirements of ERAC EPCs 51.  
 This unit standard and unit standards 29424, 29438, and 29442 meet the assessment requirements of ERAC EPCs 55.
- 3 Achievement of this unit standard alone does not entitle trainees to legally perform prescribed electrical work without supervision. Until registered and licensed under the Electricity Act 1992, trainees are assisting, and must work under supervision when carrying out prescribed electrical work.
- 4 Definitions
  - a.c.* – alternating current.
  - d.c.* – direct current.
  - Enterprise practice* – those practices and procedures that have been promulgated by the company or enterprise for use by their employees.
  - 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.
  - PV* – photovoltaic.
  - 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)*.
  - SMPS* – switched mode power supply.
  - SOPS* – self oscillating power supply.

*SPS* – stand-alone power system – may include but is not limited to – PV, solar thermal, wind, micro-hydro, biomass.

*UPS* – uninterruptible power supply.

*WEC* – wind energy conversion.

## 5 Range

- a Standard symbols to be used for all assessments.
- b Candidates may refer to current legislation and Standards during assessment.
- c Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
- d 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 uninterruptible power supply (UPS) systems.

#### Performance criteria

- 1.1 Describe the purpose of a UPS system and identify applications.
- 1.2 Outline the functions of UPS components and draw a simple block diagram.
- 1.3 Identify safety requirements and operating procedures applicable to UPS systems.

### Outcome 2

Demonstrate knowledge of standby generator sets.

#### Performance criteria

- 2.1 Outline the purpose of and types of standby generator sets.
- 2.2 Outline the function of the major mechanical and electrical components of a typical standby generator set.
- 2.3 Identify electrical loads for two applications and rank by priority of restoration.
- 2.4 Identify safety requirements and operating procedures applicable to standby generator sets.

**Outcome 3**

Demonstrate and apply knowledge of switching power supplies.

**Performance criteria**

- 3.1 Compare switching mode and self oscillating power supplies.
- 3.2 Identify safety requirements and operating procedures applicable to switching power supply systems.

**Outcome 4**

Demonstrate knowledge of renewable energy power supply systems and their safety considerations.

Range photovoltaic systems – and two of – solar thermal systems, wind energy conversion systems, micro-hydro systems, biofuel system.

**Performance criteria**

- 4.1 Describe the major components of three renewable energy systems and outline factors that can affect the performance.
- 4.2 Describe the configuration, function, advantage, and disadvantage of a typical stand-alone power system.
- 4.3 Describe the configuration, function, advantage, and disadvantage of a typical grid connected power system.
- 4.4 Identify safety requirements and operating procedures applicable to renewable energy systems.

**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>.