Title	**Demonstrate knowledge of power transformer theory for electricity supply**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of transformers; demonstrate knowledge of transformer connections and configuration; and describe phasing tests on electricity power transformers.

Classification	Electricity Supply > Electricity Supply - Core Skills

Available grade	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 industry and legislative requirements.

2 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the current version of the Health and Safety at Work Act 2015; Electricity Act 1992; Electricity (Safety) Regulations 2010; and any subsequent amendments and replacements; Electricity supply industry codes of practice and documented enterprise procedures, including *Safety Manual – Electricity Industry* (SM-EI) (2015) Wellington: Electricity Engineers' Association, available from www.eea.co.nz.

3 Definitions
Asset owner refers to a participant who owns or operates assets used for generating or conveying electricity.
Industry requirements include all asset owner requirements; manufacturers' specifications; and enterprise requirements which cover the documented workplace policies, procedures, specifications, business, and quality management requirements relevant to the workplace in which assessment is carried out.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of transformers.

Range single-phase, three-phase.

Performance criteria

1.1 Construction of a transformer is drawn, the parts are identified, and their function is described.

Range iron core, primary and secondary windings, tapping and tapping switches, oil filled, tanks, bushings, mountings.

1.2 Principle of operation is explained through use of diagrams.

Range magnetic fields, mutual induction.

1.3 Transformation ratios are described and expressed as a formula in simple calculations.

Outcome 2

Demonstrate knowledge of transformer connections and configuration.

Range single- and three-phase transformers;
star connections, delta connections, combination delta-star configurations, paralleling and single wire earth return (SWER).

Performance criteria

2.1 Connections and configurations are drawn and fully labelled.

Range voltages, phase to phase, phase to neutral, phase to earth.

2.2 The purpose of earthing connections is described in accordance with safe work practices.

Outcome 3

Describe phasing tests on electricity power transformers.

Range low voltage, high voltage transformers.

Performance criteria

3.1 Phasing terms are described.

Range includes but is not limited to – vector groupings for transformers, phase markings and identification of conductors (R, W, B, A, B, C); evidence of two is required.

3.2 Purpose of phasing checks is described.

Planned review date	31 December 2024

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 October 2007	31 December 2016
Review	2	20 March 2014	31 December 2021
Review	3	28 November 2019	N/A

Consent and Moderation Requirements (CMR) reference	0120

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

Comments on this unit standard

Please contact Connexis - Infrastructure Industry Training Organisation at qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.