Title	**Demonstrate knowledge of electrical circuit protection for electricity supply networks**		
Level	**4**	**Credits**	**5**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: electrical circuit protection for electricity supply networks; circuit protection devices used for electricity supply networks; and electrical faults causing protective devices to operate.

Classification	Electricity Supply > Electricity Supply - Distribution Networks

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) 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 electrical circuit protection for electricity supply networks.

Performance criteria

1.1 The need for circuit protection in electricity supply networks is explained.

Range cable ampacity, conductor insulation, circuit isolation, overloads and short circuits.

1.2 Circuit protection terms are explained.

Range may include but is not limited to – current rating, voltage rating, utilisation category, interrupting capacity (breaking capacity), fusing and tripping factor, excess current protection, prospective short circuit current;
evidence of four is required.

1.3 Relationship between current rating, interrupting capacity and utilisation category for a protection device is stated and explained.

1.4 The arc extinguishing and operating principles of fuse elements are explained.

Range may include but is not limited to – expulsion fuse, high rupturing capacity fuse (HRC), liquid fuse link;
evidence of two is required.

Outcome 2

Demonstrate knowledge of circuit protection devices used for electricity supply networks.

Performance criteria

2.1 Protection devices used in an electricity supply network are described showing construction and operating principles.

Range devices include – fuses, fusible links, circuit breakers, protection relays, auto-reclosers;
evidence of three different devices is required.

2.2 Types of fuse links used for protection in electricity supply networks are identified physically and by product references.

Range three different types.

2.3 Dangers around replacement of fuse links are explained.

Range electrical and or thermal burns, electric shock, arc blast.

Outcome 3

Demonstrate knowledge of electrical faults causing protective devices to operate.

Performance criteria

3.1 The causes of faults on distribution networks are explained.

Range includes but is not limited to – insulation breakdown, leakage current, over current, short circuit, physical damage, bird strike, fallen tree, possums, accidents, lightning strikes and switching surges.

3.2 Effects of electrical faults are described in terms of the danger to people, property and electricity network components.

Range evidence of three effects is required.

3.3 Importance of time in relation to the isolation of faults is explained.

3.4 The purpose and function of an auto-recloser and sectionalisers, and their location in the electricity distribution networks, are described.

Replacement information	This unit standard replaced unit standard 23896, unit standard 28276, and unit standard 28279.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 August 2020	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 qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.