Title	**Replace fuses and plug-in miniature circuit breakers**		
Level	**3**	**Credits**	**1**

Purpose	This unit standard is for use in the training of electrical technicians and service persons. It covers the replacement of fuses and plug-in miniature circuit breakers. People credited with this unit standard are able to: - demonstrate knowledge of circuit protection by means of fuses and circuit breakers; - identify the current ratings of fuses and circuit breakers; - repair and replace rewireable fuse links; - replace high-rupturing capacity (HRC) fuses; and - replace and re-set plug-in type of miniature circuit breakers.

Classification	Electrical Engineering > Electrical Service Technicians

Available grade	Achieved

Guidance Information

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

2 Competency under this unit standard does not entitle the candidate to legally perform prescribed electrical work without adequate supervision until the candidate has been registered and licensed under the Electricity Act 1992.

3 References
Electricity (Safety) Regulations 2010;
Electricity Act 1992;
Health and Safety at Work Act 2015, and associated regulations;
New Zealand Electrical Codes of Practice available at https://www.worksafe.govt.nz/laws-and-regulations/standards/electricity-standards-and-codes-of-practice/;
and all subsequent amendments and replacements.

4 Definitions
Electrical technicians and service persons – for the purposes of this unit standard means, people who hold or who are working towards electrical registration as an Electrical Service Technician, Electrical Appliance Serviceperson (endorsed to disconnect and connect), or Electrical Appliance Serviceperson.
HRC – high rupturing capacity.
Industry practice – those practices which competent practitioners within the industry, recognise as current industry best practice.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of circuit protection by means of fuses and circuit breakers.

Performance criteria

1.1 The effects of electrical faults are described in terms of the danger to people and property.

Range faults – leakage current, over current, short circuit; effects – electromechanical energy, heat energy, damaged cables and equipment, fire, explosion, electric shock.

1.2 The need for rapid disconnection of faulty circuits is explained, and how this is achieved by the use of fuses and circuit breakers.

1.3 The terms current rating and fusing current are explained in accordance with industry practice.

1.4 The differences between rewireable fuses, cartridge fuses, HRC fuses, and miniature circuit breakers are explained in terms of construction, operation, and relative advantages.

1.5 The importance of using a replacement fuse or circuit breaker with the correct current rating is explained, with reference to the effects of under-rating and over-rating.

1.6 Fuses which may be repaired are identified, and reasons given as to why others must not be repaired.

1.7 An explanation is given of the procedure to be followed if a fuse or circuit breaker operates a second time in response to the same fault.

Range leave circuit isolated at fuse or circuit breaker, apply tag, remove appliance from service and have it repaired, if necessary, call an electrician.

Outcome 2

Identify the current ratings of given fuses and circuit breakers.

Range rewireable fuse carrier, cartridge type fuse, HRC fuse, plug-in miniature circuit breaker.

Performance criteria

2.1 The current rating of each device is identified from examination of markings and/or manufacturers' data.

Outcome 3

Repair and replace rewireable fuse links.

Performance criteria

3.1 Defective appliance is disconnected, and main switch turned off before removal of fuse carrier if possible.

3.2 Fuse carrier is cleaned of fragments of old fuse wire.

3.3 Fuse wire matches the current rating marked on the carrier and is repaired according to industry practice.

3.4 After reinsertion, the fuse carrier is free of protruding ends of fuse wire and is fully seated in its base.

Outcome 4

Replace HRC fuses.

Performance criteria

4.1 Defective appliance is disconnected, and main switch turned off before removal of carrier if possible.

4.2 Fuse cartridge is replaced in carrier with one of same size, characteristic, and rating in accordance with industry practice.

4.3 After reinsertion, the fuse carrier is fully seated in its base.

Outcome 5

Replace and re-set plug-in type of miniature circuit breakers.

Performance criteria

5.1 Defective appliance is disconnected, and main switch turned off before removal of circuit breaker if possible.

5.2 Replacement circuit breaker matches the base and has the same characteristic and rating as the original.

5.3 After reinsertion, the circuit breaker is fully seated in its base.

5.4 Circuit breaker is re-set in accordance with industry practice.

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	25 November 2000	31 December 2013
Revision	2	3 April 2001	31 December 2013
Revision	3	19 May 2004	31 December 2013
Review	4	20 June 2006	31 December 2024
Rollover and Revision	5	20 September 2012	31 December 2024
Revision	6	15 January 2014	31 December 2024
Rollover and Revision	7	25 March 2021	31 December 2024
Review	8	2 March 2023	31 December 2024

Consent and Moderation Requirements (CMR) reference	0003

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