

Title	Demonstrate knowledge of mobile and re-locatable systems		
Level	4	Credits	15

Purpose	<p>This unit standard is intended for service technicians and servicepersons who install, diagnose and repair mobile and re-locatable systems, associated hardware, and services.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – demonstrate knowledge of mobile and re-locatable systems; – read and interpret electrical diagrams to describe mobile and re-locatable systems functions; – demonstrate knowledge of cables and connections used in mobile and re-locatable systems; – demonstrate knowledge of connecting hardware and support facilities used with mobile and re-locatable systems; – demonstrate knowledge of the impact of an emerging or converging technology on mobile and re-locatable systems; and – describe professional development opportunities regarding new technologies for mobile and re-locatable systems.
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Classification	Electrical Engineering > Electrotechnology
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Available grade	Achieved
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Guidance Information

- 1 Recommended unit standards for entry:
 - Unit 27912, *Demonstrate knowledge of electrical principles in an electrotechnology or telecommunications environment*;
 - Unit 30641, *Demonstrate knowledge of electromechanical engineering principles for technicians*;
 - Unit 30648, *Demonstrate knowledge of installation practices and procedures for customer premises systems*;
- 2 References
 - AS/NZS 4509.1: 2009 *Stand-alone power systems Part 1: Safety and installation*, available from <https://www.standards.govt.nz>;
 - AS/NZS 4509.2: 2010 *Stand-alone power systems Part 1: System design*, available from <https://www.standards.govt.nz>;
 - AS/NZS 5033: 2014 *Installation and safety requirements for photovoltaic (PV) arrays*, available from <https://www.standards.govt.nz>;

Compliance Standards for EMC and Radio, available from <https://www.rsm.govt.nz/>;
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Health and Safety at Work Act 2015;
Official Information Notices, available from <https://www.rsm.govt.nz/>;
and all subsequent amendments and replacements.

3 Definitions

Company practice – those practices and procedures that have been circulated by the company for use by their employees.

Industry conventions – a set of agreed, specified, or generally accepted standards.

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.

Safe and sound practice – relating to the installation of electrical equipment as defined in AS/NZS 3000:2018 *Electrical Installations - Known as the Australian/New Zealand Wiring Rules*.

Service technicians and servicepersons – 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.

4 Assessment

a Competence may be assessed on:

- i Systems installations may include but are not limited to – radio, low voltage, extra-low voltage, data and voice, TV, standalone power systems, solar;
- ii Locations may include but is not limited to – vehicles, caravans, mobile homes, transmission and reception sites, repeaters, mobile sites;
- iii Cabling and communications may include but is not limited to – copper, twisted-pair, coaxial copper, data cable, Wi-Fi, Bluetooth or some combination of these;

b All measurements are to be expressed in Système Internationale (SI) units and multipliers.

c Mathematical proof of the subject matter covered by this unit standard is not required.

5 Range

a 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 safe and sound practice;
- vi applicable site, company and industry practice, and industry conventions;
- vi where appropriate or applicable, environmental requirements, manufacturer instructions, specifications, data sheets and manufacturer, supplier and company health and safety procedures.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of mobile and re-locatable systems.

Performance criteria

- 1.1 Describe system interfaces, explain how they work and identify the nature of the interface signals.
- Range interface may include but is not limited to – hardware, human, electronic, radio, Bluetooth, Wi-Fi, optical, signal; evidence of five is required.
- 1.2 Describe typical configuration requirements for mobile and re-locatable installations.
- Range description includes how the configuration is carried out; evidence of three is required.
- 1.3 Describe the use of test equipment required to take measurements, and perform adjustments in terms of configuration, commissioning, performance and restoration of operation of systems and hardware.
- 1.4 Identify hazards associated with installing or servicing systems and interfaces and outline the safety procedures in each case.

Outcome 2

Read and interpret electrical diagrams to describe mobile and re-locatable systems functions.

Performance criteria

- 2.1 Describe mobile and re-locatable systems functions using electrical diagrams.
- Range diagrams may include but is not limited to – block diagrams, functional flow block diagrams, signal flow graph, schematic; evidence of three different systems using at least two types of diagrams is required.
- 2.2 Explain the function and theory of operation of an identified segment or section.
- 2.3 Describe the expected values and identify the test points for expected signals associated with an identified segment or section.
- 2.4 Identify faults for a segment or section and describe symptoms for the fault conditions in terms of expected changes to signals attributable to the fault.

2.5 Describe the operation of hardware and support facilities used with mobile and re-locatable installations.

Range evidence of hardware and support facilities relevant to two systems is required.

2.6 Describe the expected measurements at given points of the hardware and support facilities described for the installation.

Outcome 3

Demonstrate knowledge of cables and connections used in mobile and re-locatable systems.

Performance criteria

3.1 Compare and contrast the types of cables used in mobile and re-locatable installations.

Range may include but is not limited to – construction, application, installation requirements, performance, interface between cable types.

3.2 Compare categories of Ethernet cables in terms of application and performance.

Range may include but is not limited to – Cat 5, Cat 5e, Cat 6, Cat 6a, crossover.

3.3 Describe the pinout and wiring when using Cat 5 and Cat 5e cabling.

3.4 Compare T568A and T568B colour codes for RJ45 modular plugs in terms of pinout.

Outcome 4

Demonstrate knowledge of connecting hardware and support facilities used with mobile and re-locatable systems.

Performance criteria

4.1 Explain the operation of common interfacing methods used with the hardware and support facilities in terms of method and expected power, voice and/or data transfer.

Range evidence of four types of interface is required.

4.2 Describe features and specifications of the identified interfaces between the hardware and support facilities and the installation.

4.3 Describe common human interface systems in terms of type, user-friendliness, and reliability.

- 4.4 Identify typical faults in hardware and support facilities, and describe symptoms for given fault conditions in terms of expected changes to signals and voltages attributable to the fault.

Outcome 5

Demonstrate knowledge of the impact of an emerging or converging technology on mobile and re-locatable systems.

Performance criteria

- 5.1 Describe an emerging or converging technology that may impact on existing systems or hardware with reference to purpose, facilities or services offered.
- Range selected technology should be one applicable to the New Zealand environment.
- 5.2 Explain how the emerging or converging technology will impact upon or integrate with existing technologies.
- Range may include but is not limited to – customer benefit, business efficiencies, competitive advantage.

Outcome 6

Describe professional development opportunities regarding new technologies for mobile and re-locatable systems.

Performance criteria

- 6.1 Describe professional development opportunities for technologies in New Zealand.
- Range may include but is not limited to – conferences, trades shows, internal and external training courses, product courses, meetings, books, brochures, manuals, surveys, webinars; evidence of three is required.

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	23 January 2020	31 December 2023
Review	2	25 November 2021	31 December 2023

Consent and Moderation Requirements (CMR) reference	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

This unit standard is expiring