

<b>Title</b>	<b>Diagnose faults and repair basic extra-low voltage and low voltage customer premises systems</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	<p>This unit standard covers diagnosis and repair of basic extra-low voltage and low voltage customer premises systems cabling, equipment, systems, and services.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>– ensure regulatory compliance while working on data networks;</li> <li>– perform non-complex fault location associated with faulty operation of extra-low voltage and low voltage customer premises systems installation; and</li> <li>– replace or repair faulty components or modules to restore subsystems on systems, hardware, and related ICT systems and services to operation.</li> </ul>
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<b>Classification</b>	Electrical Engineering > Electrotechnology
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<b>Available grade</b>	Achieved
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<b>Prerequisites</b>	Unit 27911, <i>Demonstrate knowledge of workplace safety in an electrotechnology or telecommunications environment</i> ; Unit 30647, <i>Apply safe working procedures and practices in an electrotechnology environment and identify and control special hazards</i> ; or demonstrate equivalent knowledge and skills.
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### Guidance Information

- 1 This unit standard has been designed for learning and assessment on-job.
- 2 Evidence against this unit standard must be in accordance with industry practice and, where appropriate, must reflect environmental conditions.
- 3 References  
Electricity Act 1992;  
Electricity (Safety) Regulations 2010;  
Search and Surveillance Act 2012;  
Telecommunications Act 2001;  
and all subsequent amendments and replacements.

#### 4 Definitions

*Cable* – copper cable (which includes coaxial cable), fibre optic cable.

*Consent* – any permits of work that are required prior to work being undertaken.

*CPE* – Customer Premises Equipment.

*ESD* – Electrostatic Discharge.

*ETP* – External Termination Point.

*Half split* – a fault location technique in which the system is continuously split in half, and the faulty section isolated for further investigation.

*ICT* – Information and Communications Technology

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

*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)*.

*Transit bodies* – organisations that have authority relating to control of access, roads, right of ways and control of traffic.

#### 5 Range

- a Evidence is required of at least 6 non-complex repairs on at least four installations, and involving repair or replacement wiring, wiring systems, electrical or electronic modules, electronic components, or a combination.
- b The assessment of this unit standard must be related to the candidate's area of workplace practice, and must be completed within industry acceptable time frames.
- c Demonstration of safe working practices 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;
  - vi where appropriate, manufacturer instructions, specifications, and data sheets.

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### Outcomes and performance criteria

#### Outcome 1

Ensure regulatory compliance while working on data networks.

Range evidence of three different work sites, with one requiring consent, is required.

#### Performance criteria

1.1 Perform hazard identification and management practices.

1.2 Maintain work site in accordance with regulations.

Range may include but is not limited to – outdoor environment, water management, traffic management, health and safety.

1.3 Identify requirements and arrange required consents to obtain access to a network site.

Range consents may include but are not limited to – installations, outdoor environment, water management, traffic management; authorities may include but are not limited to – council, utilities, transit bodies.

1.4 Perform work in accordance with conditions of issued consents.

Range installations, outdoor, water management, traffic management.

## Outcome 2

Perform non-complex fault location associated with faulty operation of an extra-low voltage and low voltage customer premises systems installation.

### Performance criteria

2.1 Perform preparation tasks that should be undertaken before leaving for a site.

Range collection of information about the fault, arranging site access, health and safety requirements, service spares obtained, specialist tools obtained.

2.2 Perform site arrival procedures.

Range may include but is not limited to – customer communication, visual inspection for damage, check CPE alarms, determine appropriate diagnostic procedure, apply health and safety procedures.

2.3 Select and use appropriate test equipment to determine the nature and location of the fault.

Range tests may include but are not limited to – earths, battery contacts, disconnections, resistance, capacitance, noise, dB loss, high bit error rate, cable location equipment, multi-meter, clamp meter, insulation resistance tester, oscilloscope; Items to be tested include but are not limited to – copper, fibre, CPE.

2.4 Apply logical fault-finding methodologies.

Range may include but is not limited to – common alarms, half split, step-by-step, flowcharts, manufacturer diagnostic procedures, resetting of equipment.

2.5 Check that fault diagnosis data is valid, current, and complete.

**Outcome 3**

Replace or repair faulty components or modules to restore subsystems on systems, hardware, and related ICT systems and services to operation.

**Performance criteria**

3.1 Complete repair in accordance with repair plan, agreed end-user expectations, equipment specifications, and safety regulations.

Range equipment specifications – manufacturer, operational; safety regulations – personnel, equipment.

3.2 Restore equipment components and system operation to specified technical performance.

3.3 Perform operational tests and commissioning after repair.

Range may include but is not limited to – physical and software configuration recovery, replacement of modules, ESD protection, evaluation of system status, fault monitoring, hand back of service.

3.4 Complete documentation and hand back to end-user in accordance with legislation and company procedures.

Range training, user-familiarisation, user documentation, satisfaction feedback, quality control monitoring, preventative measures and or procedures.

3.5 Remove equipment, plant, and tools used for repair from site, refurbish them to be fully operational and in a safe condition for use, and store them in the correct place ready for re-use.

3.6 Complete documentation relating to the repair of equipment components and file it in accordance with legislation, company procedures, and end-user requirements.

Range invoices, histories, project reports, stock re-ordering, sign offs, warranties, contractual obligations.

<b>Planned review date</b>	31 December 2027
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	14 December 2017	31 December 2024
Review	2	2 March 2023	N/A

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

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### Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at [qualifications@waihangaararau.nz](mailto:qualifications@waihangaararau.nz) if you wish to suggest changes to the content of this unit standard.