

Title	Restore operation and performance of commercial systems, equipment, and services		
Level	4	Credits	15

Purpose	<p>This unit standard is intended for electrical technicians and servicepersons, who test, diagnose and repair complex faults to a modular level and/or configure commercial systems to restore operation and performance of commercial systems and associated equipment.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – perform routine maintenance and/or complex fault location on commercial systems, associated equipment and services; – restore faulty commercial systems, associated equipment and services to normal operation and performance; and – update maintenance records for commercial systems, associated equipment and services following maintenance or fault correction.
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Classification	Electrical Engineering > Electrical Appliance Servicing
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Available grade	Achieved
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Prerequisites	<p>Unit 27911, <i>Demonstrate knowledge of workplace safety in an electrotechnology or telecommunications environment</i>; Unit 28881, <i>Enhance workplace safety and mitigate environmental impacts in an electrotechnology or telecommunications environment</i>; or demonstrate equivalent knowledge and skills.</p>
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Guidance Information

- 1 This unit standard has been developed for learning and assessment on job or off job in a simulated workplace environment or combination under adequate supervision as defined in the Electricity Act 1992, unless the candidate is registered and licenced under the Electricity Act 1992.

- 2 Recommended unit standards for entry
 Unit 30642, *Demonstrate knowledge of specialist equipment used in electronic repairs*;
 Unit 30644, *Demonstrate basic knowledge of diagnostics and fault finding for service and installation technicians*;
 Unit 30651, *Explain regulatory requirements for installing and servicing extra-low and*

low voltage customer premises systems.

3 References

Consumer Guarantees Act 1993;
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Fair Trading Act 1986;
Hazardous Substances and New Organisms Act 1996 1 October 2018 reprint;
Health and Safety at Work (Hazardous Substances) Regulations 2017;
Health and Safety at Work Act 2015;
Privacy Act 1993;
Resource Management Act 1991;
Contract and Commercial Law Act 2017, *Part 3 Sale of Goods*;
New Zealand Electrical Codes of Practice, ISSN 0114-0663, available from www.worksafe.govt.nz;
and all subsequent amendments and replacements.

4 Definitions

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

COC – Certificate of Compliance.

Complex fault – three or more components or subsystems used or operating together in commercial systems.

Co-ordinate – includes supervision, facilitation, and active involvement in the work to be completed.

Electrical 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.

ESC – Electrical Safety Certificate.

Industry acceptable time-frame – the length of time within which a competent person at this level could reasonably be expected to perform the task. In the appliance service industry, time is a significant factor in judging competence. Assessors must therefore ensure that the time taken is representative of industry expectations for the type of servicing undertaken.

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.

Non-standard – three or more services or systems used or operating together to provide a purpose-built commercial system solution based on customer or installation requirements.

PCB – Printed Circuit Board.

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)*.

SDoC – Supplier Declaration of Conformity (producer statement).

- 5 Range
- a Competence may be assessed on commercial systems which may include but are not limited to – air conditioning, interconnected catering installation, ventilation, heating, extractor, climate control, central vacuum, prewash, interconnected retail installation, interconnected medical installation, enterprise specific system, interconnected office equipment installation, purpose built commercial solution.
 - b Evidence is required of three different systems for each outcome of this unit standard, with one being a non-standard system, except where otherwise indicated. The systems must be relevant to, and in context for the industry sector the candidate works in.
 - c Electrical, radiation, and workshop or laboratory safety practices must be observed at all times.
 - d All work must be performed within industry acceptable time-frames.
 - e All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
 - i legislation;
 - ii company 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;
 - vii where appropriate or applicable, environmental requirements, manufacturer instructions, specifications, data sheets and manufacturer, supplier and company health and safety procedures.
- 6 Persons assessing against this unit standard are required to hold a current practising licence at or above the level being sought by the trainee.

Details about classes of registration for electrical workers are available at EWRB Electrical Licensing Classes.

Outcomes and performance criteria

Outcome 1

Perform routine maintenance and/or complex fault location on commercial systems, associated equipment and services.

Performance criteria

- 1.1 Perform preparation tasks before leaving for site.
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| Range | may include but not limited to – collection of fault information, system performance information, site access including permits and consents, health and safety, remote log in, other site checks, service spares, tools. |
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- 1.2 Evaluate remote restoration methods and procedures and apply as appropriate.

- 1.3 Co-ordinate and apply site arrival procedures.
- Range log in as on-site, inspect site for damage, health and safety.
- 1.4 Carry out visual inspection and maintenance checks on arrival.
- Range may include but is not limited to – equipment integrity, corrosion, bonding and earthing, cable or interface management, weather proofing, connections, dust, equipment or ventilation system filters, air flow, fault codes;
fault codes may include but are not limited to – manuals, flowcharts, manufacturer specifications and diagnostic procedures, built in diagnostic modules, remote interface, hand-held interface, computer or mobile phone app interface.
- 1.5 Select test instruments, diagnostic tools and/or equipment.
- 1.6 Apply logical fault-finding techniques to identify the cause of the faults.
- Range techniques may include but are not limited to – customer feedback, questioning, observation, simulation, measurement, identification of function loss, comparison with previous fault data including frequency of occurrence, manufacturer’s documentation and diagnostic procedures, maintenance records, trending, built-in diagnostics, alarm priority, comparison with commissioning results, half split, step by step, resetting modules, testing.
- 1.7 Perform tests without impact on the performance of functioning services where relevant.
- 1.8 Interpret test results to identify faulty component(s) or subsystem(s).
- Range may include but is not limited to – PCB, module, cable, component, interface, associated equipment, configuration, cooling system, power and backup system, firmware, software.
- 1.9 Replace faulty module in accordance with best practice procedure.
- Range physical and software configuration recovery, replacement of module, ESD protection, re-configuration of module, evaluation of system status, fault monitoring.
- 1.10 Perform operational tests and performance verification after replacement.
- Range may include but is not limited to – physical, firmware and software configuration, replacement of module and/or component, associated service and equipment, evaluation of system status, evaluation of system performance, fault monitoring.

- 1.11 Co-ordinate site departure procedure in accordance with company practice.
- Range may include but is not limited to – alarm check, system restored to automatic, alarm service restored to normal, ventilation system restored to normal.
- 1.12 Co-ordinate post-job tasks.
- Range may include but is not limited to – arrange faulty unit repair through appropriate processes, log and file information in relevant system, complete customer report as required, close out job tasks in appropriate management system.

Outcome 2

Restore faulty commercial systems, associated equipment and services to normal operation and performance.

Performance criteria

- 2.1 Repair or replace faulty module or subsystem in accordance with company, industry, and safe and sound practice.
- Range physical, firmware and software configuration recovery, replacement of module, ESD protection, module re-configuration, system status evaluation, fault monitoring.
- 2.2 Carry out operational and performance verification tests after repair.
- Range may include but is not limited to – physical, firmware and software configuration, replacement module and/or component, associated service and equipment, evaluation of system status, evaluation of system performance, fault monitoring.
- 2.3 Complete electrical, mechanical, and visual safety tests in accordance with current regulations and standards.
- 2.4 Co-ordinate site departure procedures in accordance with company practice.
- Range may include but is not limited to – alarm check, system restored to automatic, ventilation system restored to normal, power and backup system restored to normal, enclosure and cover secure.
- 2.5 Co-ordinate post-job tasks.
- Range may include but is not limited to – arrange faulty module repair or replacement, log and file information, customer report, close out job task in management system, safety testing, ESC, COC, SDoC.

Outcome 3

Update maintenance records for commercial systems, associated equipment and services following maintenance or fault correction.

Range may include but is not limited to – plans, customer records, photographs, alterations;
two of the three systems required as evidence must use an electronic record system.

Performance criteria

- 3.1 Record details of fault and remedial action in accordance with company requirements.
- 3.2 Record change(s) made to equipment during fault correction in accordance with company requirements.
- 3.3 Complete documentation, advise, and hand restored equipment back to customer and/or supervisor in accordance with company requirements, and obtain acceptance from customer.

Planned review date	31 December 2023
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	28 March 2019	N/A

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>.

Comments on this unit standard

Please contact The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.