

Title	Perform maintenance and repairs on a vessel's mechanical and electrical systems		
Level	4	Credits	5

Purpose	<p>This unit standard is intended for people studying towards a qualification in vessel operation or crewing with the intention of applying for a Maritime New Zealand license.</p> <p>People credited with this unit standard are able to: prepare for preventative and planned maintenance on a vessel's mechanical and electrical systems; perform preventative and planned maintenance on a vessel's mechanical and electrical systems; diagnose and manage faults on a vessel's mechanical and electrical systems; and perform unscheduled maintenance on a vessel's mechanical and electrical systems.</p>
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Classification	Maritime > Marine Engineering
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Available grade	Achieved
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Guidance Information

- 1 It is recommended that candidates have achieved Unit 4103, *Operate and monitor a vessel's engines and auxiliary equipment*, prior to assessment for this unit standard.
- 2 Legislation relevant to this unit standard includes:
Health and Safety at Work Act 2015.
Maritime Transport Act 1994 and subsequent amendments.
Local bylaws as applicable.
- 3 References
Maritime Rules and advisory circulars. Available at <http://www.maritimenz.govt.nz>.
- 4 Definitions
Accepted industry practice refers to standardised practices and procedures accepted by the wider maritime industry as examples of best practice.
Electrical systems may include but are not limited to alternators or generators, batteries; navigation lights; switch boards, fuses and fuse links, circuit breakers; power points, switches, lights.
Emergency procedures refers to the emergency procedures documented in the vessel's MTOP.
Maintenance plan refers to the maintenance plan documented in vessels maritime transport operator plan (MTOP).
MTOP stands for Maritime Transport Operator Plan which refers to the documented operational plan required for all commercial vessels as a part of the Maritime

Operator Safety System (MOSS), the operator certification system established under Part 19 of the maritime rules and administered by Maritime New Zealand.

Mechanical systems refer to systems such as propulsion system (main engine, gearbox, drive system), bilge system; steering systems, rudder, emergency steering; fire system, and deck equipment.

Unscheduled maintenance refers to unplanned maintenance due to breakdown, systems or equipment failure or pending failure which needs immediate rectification.

Vessel refers to any form of commercial or military watercraft; sometimes used in maritime circles interchangeably with the word *ship*.

5 Assessment information

- a The majority of maintenance required by this unit standard covers component replacement where specialist trade knowledge is not required.
- b All activities and evidence must be in accordance with accepted industry practice, vessel operating procedures, and maintenance plan.

Outcomes and performance criteria

Outcome 1

Prepare for preventative and planned maintenance on a vessel's mechanical and electrical systems.

Performance criteria

- 1.1 Spare parts, equipment, tools, and manuals required to carry out scheduled maintenance tasks are selected in accordance with manufacturer's instructions.
- 1.2 Equipment and tools are checked for fitness for use in the maintenance in accordance with manufacturer's instructions.

Outcome 2

Perform preventative and planned maintenance on a vessel's mechanical and electrical systems.

Performance criteria

- 2.1 Mechanical and electrical systems are isolated and made safe.
- 2.2 Mechanical and electrical system maintenance is performed.
- 2.3 Mechanical and electrical systems are tested prior to return to service.
- 2.4 Documentation is accurate, complete, and filed.
- 2.5 Maintenance materials and equipment are handled, stored, and secured.

Outcome 3

Diagnose and manage faults on a vessel's mechanical and electrical systems.

Performance criteria

3.1 Faults are diagnosed in accordance with manufacturer’s instructions.

3.2 Diagnoses are documented.

3.3 Faults that cannot be diagnosed are managed.

Range three scenarios.

Outcome 4

Perform unscheduled maintenance on a vessel’s mechanical and electrical systems.

Performance criteria

4.1 Mechanical components requiring replacement are identified, removed and replaced in accordance with manufacturer’s instructions.

Range oil filter, fuel filter, pump impeller, engine cooling hose, V belt.

4.2 Electrical components requiring replacement are isolated, removed and replaced.

Range deck light bulb, navigation light bulb, fuse, circuit breaker, switch, wire join, wire terminal attachment.

4.3 Replaced components are tested.

4.4 Repairs to mechanical systems are carried out in a manner that allow the vessel to continue to operate without causing further damage to the vessel and/or its engines and equipment.

4.5 Repairs are undertaken and are conducted using the appropriate tools and techniques in accordance with manufacturer’s instructions.

4.6 Improvised repairs are performed to rectify component failures where replacement or full repair is not possible.

Range one electrical and two mechanical.

Planned review date	31 December 2025
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	30 July 2002	31 December 2016
Review	2	18 March 2011	31 December 2016
Review	3	15 October 2015	31 December 2022
Review	4	24 September 2020	N/A

Consent and Moderation Requirements (CMR) reference

0054

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

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.