

Title	Demonstrate knowledge of marine electrical power supply, monitoring and charging systems		
Level	4	Credits	15

Purpose	People credited with this unit standard are able to: demonstrate knowledge of marine battery charging; describe and draw marine battery system wiring circuits; and explain marine battery monitoring systems.
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Classification	Boating Industries > Boatbuilding
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Available grade	Achieved
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Guidance Information

Assessment against this unit standard must be compliant with either:

- (a) AS/NZS 3004.2:2014. *Electrical installations – Marinas and boats - Part 2: Boat installations*; or
- (b) ISO 10133:2017. *Small craft. Electrical systems. Extra-low voltage d.c. installations*; available at <https://shop.standards.govt.nz/>.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of marine battery charging.

Performance criteria

- 1.1 Alternating Current (AC) and Direct Current (DC) charger types and installation options are described in terms of advantages and disadvantages.
- 1.2 Features of high output marine alternators are explained in comparison with automotive alternators in terms of the marine service environment.
- 1.3 Charging control and wiring options are explained in terms of advantages and disadvantages.
 - Range includes but is not limited to – diodes, voltage sensitive relays, multi-step regulators, multiple alternator.
- 1.4 Renewable energy charging options are explained in terms of advantages, disadvantages, connection and regulation in accordance with AS/NZS 3004.
 - Range solar panels, wind, prop shaft generators.

Outcome 2

Describe and draw marine battery system wiring circuits.

Performance criteria

2.1 Different battery system wiring options are described in terms of advantages and disadvantages.

Range includes – division of service and start batteries, connecting banks of batteries, series and parallel, switches, earth.

2.2 Battery wiring schematic circuit drawings are completed in accordance with AS/NZS 3004.

Range evidence of at least three different layouts, each layout must include but is not limited to – alternator, regulation, battery switch/es, batteries, earth.

Outcome 3

Explain marine battery monitoring systems.

Performance criteria

3.1 Options for metered systems for measuring battery load and condition are explained in terms of use and wiring requirements in accordance with AS/NZS 3004.

Range includes – volts, amps, amp hours.

3.2 Set up and programming requirements for monitoring systems are explained that includes determination and programming of battery characteristics and parameters in accordance with AS/NZS 3004.

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	20 May 2011	31 December 2022
Review	2	27 August 2020	N/A

Consent and Moderation Requirements (CMR) reference	0136
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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 NZ Marine and Composites Industry Training Organisation training@nzmarine.com if you wish to suggest changes to the content of this unit standard.