



Australian Government

**Assessment Requirements for MARC049
Operate 240 to 440 voltage alternating
current electrical systems**

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion and include:

- carrying out necessary calculations associated with managing electrical systems, including:
 - adding resistors in series and parallel, and calculating current
 - battery ampere-hours and efficiency
 - series and parallel configuration of battery supply
- connecting to shore power
- isolating and locking out of electrical circuits
- maintaining records of operation of electrical systems, and any related safety incidents
- monitoring and evaluating performance of electrical systems
- performing switchboard operations, including the monitoring of electrical supply and procedures for paralleling generators
- starting emergency alternator and supply switchboard where available
- using hydrometer
- using multimeter to test for voltage and continuity.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- batteries, including:
 - charging circuits and hazards associated with charging batteries
 - operation
 - types, care and hazards
- characteristics of electrical systems
- dangers associated with operation of shipboard electrical systems and related hazard prevention strategies
- earth detection devices
- electrical distribution systems, including emergency arrangements
- electrical systems must include:

- alternators
- batteries and associated circuits
- control circuits
- motors
- starter circuits
- switchboards
- faults associated with electrical systems and appropriate preventative and remedial action, and solutions
- manufacturer instructions for the operation of electrical systems
- methods for managing operation of shipboard electrical systems
- motor and alternator construction
- motor starter circuits
- own ability and limits to rectify irregularities and faults
- principles of operation of various shipboard emergency systems, including fire detection system, internal communications system and emergency generator
- procedures for monitoring and evaluating performance of electrical systems
- relevant performance of electrical systems when unsatisfactory or outside of specified limits and appropriate actions to be taken
- relevant problems that may occur with electrical systems and appropriate preventative and remedial actions to be taken
- relevant sections of state and territory maritime regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- safety devices fitted to switchboard and other electrical systems, including fuses and circuit breakers
- sequence of required action when power unit becomes overloaded
- shore power arrangements
- single and three phase alternating current (AC) power generation.

Assessment Conditions

Assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Practical assessment must occur in a workplace, or realistic simulated workplace, under the normal range of workplace conditions.

Simulations and scenarios may be used where situations cannot be provided in the workplace or

may occur only rarely, in particular for situations relating to emergency procedures and adverse weather conditions where assessment would be unsafe, impractical or may lead to environmental damage.

Resources for assessment must include access to:

- a commercial vessel with inboard diesel propulsion power of greater than or equal to 375 kW or appropriate engine and auxiliary system ashore
- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- tools, equipment, machinery, materials and personal protective equipment (PPE) currently used in industry.

Links

Companion Volume implementation guide can be found in VetNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>