



Australian Government

Assessment Requirements for MARB038 Maintain and repair marine electrical and electronic equipment

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:

- applying relevant procedures
- communicating procedures associated with maintaining and repairing marine electrical and electronic equipment verbally and in writing
- conducting risk assessment on task to be performed
- extracting information from basic electrical and electronic diagrams required to build electrical and electronic circuits
- identifying and interpreting numerical and graphical information in vessel electrical diagrams and specifications
- identifying and suggesting ways of rectifying faults and malfunctions in marine electrical and electronic systems
- identifying methods, procedures and materials needed for operating, maintaining and repairing marine electrical and electronic systems
- initiating timely action in response to defects or damage
- reading and interpreting written information related to operating and maintaining marine electrical and electronic systems, including specifications, drawings, technical manuals, and electrical and electronic circuit diagrams
- using testing equipment to gather information on function and performance of marine electrical and electronic systems.

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:

- alternating current (AC)/direct current (DC) voltage
- batteries
- circuit breakers and interlocks fitted to circuit breakers
- circuits
- current protection relays, including:
 - operate on fault and request

- operate on fault and request and demand
- operate on fault and request and under voltage
- earthing
- electrical measuring and testing instruments
- electrical symbols, basic electrical and electronic diagrams and circuits
- faults in circuit breakers, including:
 - alignment of contactors
 - condition of:
 - closing and opening mechanisms
 - insulation barriers
 - wear and tear on linkages
- faults in electrical motor starters, including:
 - earthing
 - open circuit
- faults in automated control systems
- fault protection equipment, including:
 - differential protection device
 - fuses
 - over current devices
 - over voltage devices
 - reverse power devices
 - thermal overload devices
 - thermistor protection devices
 - under voltage devices
- function and performance testing of system monitoring devices, including:
 - alarm printer
 - data logger
- current codes, standards, regulations and industry practices
- main components of automated control systems, including:
 - actuator
 - control valve
 - controller
 - positioner
 - regulator
 - relay
 - sensor
 - servomotor
 - transducer
- marine generator testing, including:
 - testing an alternator

- nature and causes of typical start-up and shutdown malfunctions of main and auxiliary electrical and associated systems and available methods for their detection and rectification
- operation of:
 - boiler, purifier and generator shutdown systems
 - main engine shutdown protective devices
 - protective devices found onboard vessels
- operational characteristics and performance specifications for different types of electrical and electronic systems found on vessels
- principles and procedures of electrical maintenance
- purpose and content of safety data sheets (SDS)/material safety data sheets (MSDS)
- relevant procedures such as those relating to:
 - adjusting, testing and maintaining fault protection devices on switchboards
 - carrying out start-up and shutdown of electrical machinery and associated systems to ensure compliance with company and survey requirements and regulations
 - changing alarm-setting values in monitoring systems
 - confirming the accuracy of measuring monitoring
 - detecting electrical malfunctions and preventing damage
 - electrical safety and isolation
 - fault finding
 - marine maintenance, including difference between breakdown repair, planned maintenance and condition monitoring, purpose of maintenance recording and reporting procedures
 - routine maintenance on marine electrical motors (cleaning, inspection, deterioration of insulation, removal of dust and oil, and renewal of bearings)
 - safety and emergency
 - testing function and performance of protection devices as part of vessel statutory survey
- risks and safety procedures associated with working in high voltage (HV) environments
- safety, environmental and hazard control precautions and procedures relevant to start-up and shutdown of marine electrical machinery and associated systems
- safety requirements associated with working on marine electrical systems, including:
 - dangers associated with the spaces in the vicinity of busbars
 - potential dangers associated with instrument voltage/current transformer circuits
 - protection normally provided on doors of switchboard cubicles
- types of electrical and electronic equipment and components
- vessel operating systems
- vessel safety management systems (SMS)
- work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- working safely with electricity, including:
 - appropriate method of removing an electric shock victim from a live electrical situation
 - common causes of electrical accidents
 - effects of electric shock on the human body

- electrical safe working practices
- need for ensuring safe isolation of an electrical supply
- precautions that can minimise chance of electric shock.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within 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:

- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- tools, equipment, machinery, materials and relevant 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>