



Australian Government

Assessment Requirements for MARL048 Demonstrate advanced knowledge of marine auxiliary machinery and 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:

- accessing information and sketch diagrams to interpret and explain testing requirements related to the operation of marine auxiliary machines
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining principles of marine auxiliary machines
- identifying and interpreting complex numerical and graphical information related to operating, maintaining and repairing marine auxiliary machines on commercial vessels
- identifying and rectifying faults and malfunctions in marine auxiliary machines on commercial vessels
- identifying methods, procedures and materials needed for operating, maintaining and repairing marine auxiliary machines on commercial vessels
- imparting knowledge and ideas through verbal, written and visual means
- reading and interpreting complex written information related to the operation, performance and maintenance of marine auxiliary machines, including machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications, and electrical and control circuit diagrams.

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:

- auxiliary machinery, including:
 - boiler
 - compressors
 - deck machinery
 - diesel generator
 - evaporators

- pumps
- refrigerating installation
- separators
- turbo alternators
- components of refrigeration and air conditioning (RAC), including:
 - all fittings
 - safety devices
- constraints, including:
 - class requirements
 - location
 - reliability
 - time
- corrosion prevention systems, including:
 - anodes
 - chemical injection
 - impressed current
 - marine growth inhibiting systems
 - special coatings
- design features and operative mechanism of marine gas turbine and associated auxiliaries, including:
 - material selection and design features of gas turbines
- factors influencing good lubrication, including:
 - alignment
 - condition of bearing surfaces
 - flow rate
 - load
 - purity of lubricant
 - running clearances
 - speed
 - temperature
 - viscosity
- fuel testing, including:
 - density
 - fuel in lubricating oil
 - pour point
 - viscosity
 - water contamination
- fuel and lubricating oil contaminants, including:
 - air entrainment
 - incompatible fluids

- moisture
- particulate
- fuels and principles of fuel systems
- inert gas systems
- International Convention for the Prevention of Pollution from Ships (MARPOL)
- lube oil, including:
 - coolers
 - filter
 - pump
- marine air compressors and compressed air systems
- marine transmission systems
- materials failure, including non-destructive testing procedures and standards
- nature and causes of typical start-up and shutdown malfunctions of main and auxiliary machinery and associated systems, and available methods for their detection and rectification
- operational characteristics and performance specifications for the different types of auxiliary machinery and associated systems usually found on a commercial vessel, including pumps, air compressors, steering gears, heat exchangers and evaporators
- plant efficiency
- principles and procedures of machinery lubrication
- procedures for carrying out start-up and shutdown of main and auxiliary machinery and associated systems to ensure compliance with company and survey requirements and regulations
- properties of metallic and non-metallic materials
- protections, including:
 - axial displacement
 - condenser condition
 - electrical
 - expansion
 - high air temperature
 - high oil temperature
 - loss of vacuum
 - low oil pressure
 - mechanical
 - overspeed:
 - pressure
 - steam
 - steam condition
 - temperature
 - vibration
- purpose and content of safety data sheets (SDS)/material safety data sheets (MSDS)
- safety, environmental and hazard control precautions and procedures relevant to start-up and

- shutdown of marine auxiliary machinery and associated systems
- shafting systems, bearings, couplings, clutches and shaft seals and stern tubes that form the transmission system
- ship systems
- shipboard RAC systems
- steering gears and controllable pitch propeller (CPP) systems
- turbo alternators
- types of auxiliary machinery and components
- WHS/OHS legislation and policies.

Assessment Conditions

Assessors must hold credentials specified within the Standard 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:

- relevant documentation, including workplace procedures, regulations, codes of practice and operation manuals
- tools, equipment, materials, personnel and personal protective equipment (PPE) that replicate and are 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>