



Australian Government

Assessment Requirements for MARL019
Apply advanced principles of marine
engineering thermodynamics

Release: 1

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Modification History

Release 1. New unit of competency.

Performance Evidence

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

- applying relevant work health and safety/occupational health and safety (WHS/OHS) requirements and work practices
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining advanced principles of marine engineering thermodynamics
- identifying and applying relevant mathematical formulas and techniques to solve advanced problems related to marine engineering thermodynamics
- identifying and interpreting numerical and graphical information, and performing advanced mathematical calculations related to marine engineering thermodynamics, such as calculation of power, isentropic efficiencies, thermal efficiency, work and fuel consumption for gas turbine cycles
- identifying, collating and processing information required to perform advanced calculations related to marine engineering thermodynamics
- imparting knowledge and ideas through verbal, written and visual means
- using calculators to perform accurate, reliable and complex mathematical calculations
- reading and interpreting written information needed to perform complex calculations related to marine engineering thermodynamics
- solving problems using appropriate laws and principles.

Knowledge Evidence

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

- atomic and molecular weights and the kilogram-mol
- Dalton's Law of partial pressures
- enthalpy
- gas laws
- gas turbines
- heat transfer:
 - methods
 - principles
- internal combustion engine cycles
- Laws of Thermodynamics
- noise and vibration control:
 - fundamentals of sound
 - noise and vibration problems
 - methods of control
 - operating cycle of reciprocating air compressors
- operating principles of two-stroke and four-stroke internal combustion engines
- principles of refrigeration
- Rankine cycle
- System International (SI) units
- thermal efficiency calculations
- WHS/OHS requirements and work practices.

Assessment Conditions

Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.

Assessment must satisfy the National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) standards.

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.

Assessment must occur in workplace operational situations or where these are not available, in simulated workplace operational situations or an industry-approved marine operations site that replicates workplace conditions where advanced principles of marine engineering thermodynamics can be applied.

Resources for assessment include access to:

- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
- diagrams, specifications and other information required for performing advanced calculations related to marine engineering thermodynamics
- technical reference library with current publications on marine thermodynamics

- tools, equipment, materials and personal protective equipment currently used in industry.

Performance should be demonstrated consistently over time and in a suitable range of contexts.

Links

Companion Volume implementation guides are found in VETNet -

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