



Australian Government

Assessment Requirements for MARL021

Apply advanced principles of naval architecture

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:

- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- identifying and applying relevant mathematical formulas and techniques to solve complex problems related to speed, fuel consumption and stability of commercial vessels
- identifying and interpreting numerical and graphical information, and performing mathematical calculations related to shipboard areas and volumes, vessel displacement, ship dimensions, centre of gravity, vessel speed, fuel consumption and hydrostatic pressure
- identifying, collating and processing information required to perform calculations related to speed, fuel consumption and stability of commercial vessels
- imparting knowledge and ideas through verbal, written and visual means
- reading and interpreting written information needed to perform calculations related to seaworthiness of commercial vessels
- solving problems using appropriate laws and principles
- using calculators to perform accurate, reliable and complex mathematical calculations.

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:

- advanced principles of naval architecture
- buoyancy
- centre of gravity – KG, VCG and LCG
- centre of gravity calculations
- density correction formula
- dynamical stability
- fuel consumption calculations
- hydrostatic pressure

- principle of displacement
- principle structural members of a ship and the proper names of the various parts
- rudders
- ship:
 - displacement
 - measurements
 - resistance
 - stability
 - stability calculations
- shipboard:
 - areas
 - volumes
- ship form coefficients
- Simpson's Rules
- stability problems
- tonnes per centimetre immersion (TPC)
- trim and stress tables, diagrams and stress calculating equipment
- vessel speed calculations
- vibration
- work health and safety/occupational health and safety (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 an industry-approved marine operations site where advanced principles of naval architecture can be applied.

Resources for assessment include access to:

- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
- relevant regulatory and equipment documentation that impacts on work activities
- technical reference library with current publications on naval architecture
- tools, equipment and personal protective equipment currently used in industry

- vessel diagrams and specifications and other information required for mathematical calculations related to shipboard areas and volumes, vessel displacement, ship dimensions, centre of gravity, vessel speed, fuel consumption and hydrostatic pressure.

Performance is 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>