



Australian Government

Assessment Requirements for MARL044

Apply basic principles of marine mechanics

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:

- 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 basic problems related to marine mechanics
- identifying and interpreting numerical and graphical information, and performing mathematical calculations to determine resultant and equilibrant of coplanar forces, linear and angular velocity, and hoop and longitudinal stress in thin walled pressure vessels
- identifying, collating and processing information required to perform basic calculations related to marine mechanics
- performing accurate and reliable mathematical calculations using a calculator
- reading and interpreting written information needed to perform basic calculations in marine mechanics
- 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 and performance criteria and include knowledge of:

- centre of gravity (CG)
- conservation of energy theorem
- dynamics, including:
 - relationship between speed, acceleration, mass, force and resistance
 - velocity and the effect of change of direction
- effective verbal, written and visual communication strategies
- factor of safety
- fluids, including effects of pressure and its relationship to depth of liquid and force
- force
- hydraulics
- hydrostatics

- joint efficiency factor
- laws of motion
- mass and volume
- momentum
- nature and laws of friction
- pressure vessels, including:
 - deformation of flat surfaces
 - strengths of dished or spherical end-plates in comparison to flat end-plates
- principles of marine mechanics
- reasons for:
 - using dished or spherical end-plates to give a higher strength than flat end-plates of similar thickness
 - using stays on flat surfaces
- simple machines, including:
 - hydraulic jack
 - pulley blocks
 - reduction gears
 - screw jack
 - single and double purchase crab winches
 - warwick screw
 - wheel and axle
 - worm driven chain blocks
- statics
- stress and strain
- thin cylinder theory
- types and uses of simple machines
- work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices.

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 industry approved marine operations site or 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
- diagrams, specifications and other information required for performing basic calculations related to marine mechanics
- 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>