



Australian Government

MARA004 Manage vessel stability

Release: 1

MARA004 Manage vessel stability

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage the dynamic factors affecting the stability of a vessel up to 80 metres.

This unit applies to people working in the capacity of Master on a range of vessels up to 80 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

A - Handling Cargo and Vessel Stability

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Calculate stability	1.1	Vessel stability data book is made available and checked for endorsement
	1.2	Data is interpreted to determine safety parameters for vessel
	1.3	Stability is accurately calculated using data extracted from vessel stability data book
	1.4	Stability calculations are checked to ensure they correlate with data set out in vessel stability book
	1.5	Miscalculations or unsafe conditions are recognised and recalculated or checked
	1.6	Calculated stability data is recorded using appropriate units

		and correct number of significant figures
2	Control vessel stress and stability	2.1 Information from vessel stability information is used to determine loading limits and displacement from draft 2.2 Vessel weight distribution is managed to maintain stability condition within safe limits at all times and regulatory requirements are complied with under all conditions of loading 2.3 Relevant stability information is correctly communicated to others as required 2.4 Stability conditions of vessel are managed in adverse weather conditions 2.5 Emergencies that may jeopardise vessel stability are recognised and appropriate action is taken
3	Maintain records of stability management	3.1 Data and information related to stability management is accurately recorded 3.2 Data and information related to stability management is filed and stored according to organisational procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Stability calculations must • correlation against stability book data

include:

- draft
- final height of the centre of gravity above the keel of a vessel (KG)
- trim

Loading limits include one or more of the following:

- not exceeding allowable passenger carrying capacity and distribution
- not exceeding vessel designed cargo carrying capacity
- understanding the effect of fuel, fresh water and ballast on cargo capacity

Emergencies include one or more of the following:

- cargo shift
- damaged hull
- flooding of cargo spaces

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA4002A Manage vessel stability.

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MARA004 Manage vessel stability

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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:

- attending to appropriate level of detail in recordkeeping
- carrying out basic calculations associated with maintaining vessel stability
- managing loading and weight distribution of vessel to ensure assigned load line conditions are not exceeded
- managing stability of vessel in a range of conditions
- producing reliable documentation
- recognising problems affecting vessel stability.

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:

- bilging and permeability
- centroids and centre of gravity
- change of draught and trim (MCT)
- conditions of stable, neutral and unstable equilibrium and effects of disturbing vessel from upright
- construction features and stress characteristics for vessels
- density and specific gravity
- dockwater and freshwater allowance
- effects of free surface of liquids
- factors that affect the rolling period of vessel
- forces and moments
- information contained in stability data books
- loading and discharging weights
- principal stresses that act on the structure of a vessel
- principles of vessel stability
- procedures for carrying out basic calculations associated with vessel stability
- relationship between light displacement, loaded displacement and deadweight tonnage
- stability curves
- steps involved in bringing an unstable vessel to a stable condition
- tonnes per centimetre immersion (TPC)

- transverse and longitudinal dynamics
- work health and safety (WHS)/occupational health and safety (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 occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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.

Resources for assessment must include access to:

- tools, equipment, machinery, materials and personal protective equipment currently used in industry
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

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