



Australian Government

MARM011 Calculate, assess and report on vessel trim and stability

Release: 1

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Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to assess and report on vessel trim and intact stability as part of the survey function. It is limited to undertaking practical stability tests, simplified stability calculations, reporting inclining experiments and consideration of damage stability implications.

This unit applies to people working in the maritime industry as a domestic commercial vessel marine surveyor and may form part of accreditation requirements for surveyors under Australian legislation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable.

Competency Field

M – Marine Surveying

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 Plan and prepare stability testing

- 1.1 Applicable stability criteria for class of vessel and its operations are identified and confirmed against regulatory requirements
- 1.2 Differences between Uniform Shipping Laws (USL) and National Standard for Commercial Vessels (NSCV) standards for assessing stability are identified and applied to survey plan as required

- 1.3 Information and data is used to establish and verify stability characteristics required for safe operation
- 1.4 Types of stability related hazards that may occur during all types of operations are identified
- 1.5 Range of intended and/or likely vessel loading conditions are accurately identified and their impact on stability is assessed
- 2 Calculate vessel trim and stability**
 - 2.1 Simplified stability calculations are performed to assess compliance with applicable stability criteria
 - 2.2 Stability assessment methods for equivalent solutions are applied as necessary according to regulatory requirements
 - 2.3 Trim, draughts and freeboard are measured accurately to safely and efficiently allow assessment of compliance with criteria
 - 2.4 Effects of weight distribution that may compromise vessel safety are included in stability assessment
 - 2.5 Computer-based stability programs are used as appropriate to assist with assessing compliance
 - 2.6 Results are recorded and verified to confirm compliance
 - 2.7 Appropriate methods are used to ensure vessel is not put at risk during assessment
- 3 Apply tests, assessments and theories to confirm compliance**
 - 3.1 Tests and assessments that could assist to confirm stability compliance are verified and carried out according to safety instructions
 - 3.2 Small angle stability theories are used to establish metacentric height (GM) through transverse movement of weights across vessel deck
 - 3.3 Causes of inaccuracies and limitations of assumptions in tests, assessments and theories are interpreted accurately and considered in stability assessment report
- 4 Identify other impacts on stability calculations**
 - 4.1 Types and effects of damage on vessel stability are identified and considered according to regulatory requirements
 - 4.2 Damage stability considerations are accurately identified and effect of damage is correctly quantified
 - 4.3 Operational impact on stability is identified and considered

in compliance assessment

4.4 Vessel safety management plan is reviewed to ensure known or likely impacts on stability are included

5 Document and report findings

5.1 Records are maintained and reports are prepared according to regulatory and organisational guidelines

5.2 Survey report is completed according to regulatory requirements

Foundation Skills

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

Range of Conditions

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

Applicable stability criteria includes one of the following:

- NSCV guidelines
- USL Code

Regulatory requirements include one of the following:

- Marine Safety (Domestic Commercial Vessel) National Law
- NSCV

Information and data include one or more of the following:

- cargo information
- load lines
- means to:
- sound tanks
- read draught marks
- stability book

Tests and assessments include one or more of the following:

- buoyancy and stability after flooding
- freeboard
- lightship measurement
- practical inclining
- roll period test
- simplified stability tests
- stability proof test

Types and effects of damage include one or more of the following:

- added mass
- flooding
- large amounts of water on deck
- lost buoyancy

Stability considerations include one or more of the following:

- ballast management
- closing openings
- damage control measures to maintain, stabilise or restore watertight integrity of hull
- distribution of load on a vessel
- positioning of stowage and lashing of cargo, stores and equipment
- taking action to avoid or minimise cargo shift
- taking precautions when using lifting equipment and other associated equipment

Operational impact includes one or more of the following:

- ballast
- cargo
- crew movement
- cross connections
- lifting gear (including cranes on deck)
- passengers and passenger movements
- towing
- vessel mooring arrangements
- wind/ice and other weather constraints

Unit Mapping Information

This unit replaces and is equivalent to MARM5001A Calculate, assess and report on vessel trim and stability.

Links

Companion Volume implementation guides are found in VETNet -

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