



Australian Government

MARM3002A Apply vessel construction theory to marine survey tasks

Release 1

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Modification History

Release 1

This is the first release of this unit.

Unit Descriptor

This unit involves the skills and knowledge required to recognise how the construction and structural issues of commercial vessels relate to marine survey tasks.

Application of the Unit

This unit applies to people:

- who assist marine surveyors or undertake administration duties in the maritime industry and/or marine surveying sector
- working in the maritime industry as a marine surveyor assistant and may form part of requirements for the Certificate IV in Domestic Commercial Vessel Survey and accreditation as a marine surveyor by Australian Maritime Safety Authority (AMSA) under Marine Safety (Domestic Commercial Vessel) National Law.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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| 1 Identify major parts of a hull relevant to commercial vessel inspections and surveys | <p>1.1 <i>Appropriate nomenclature</i> is used to identify major parts of hull to be inspected as part of <i>commercial vessel</i> marine survey</p> <p>1.2 Structure of vessel hull in plan-view, profile, cross-section and perspective are accurately analysed across a range of different <i>plans and drawings</i> of vessels to determine survey requirements</p> <p>1.3 Use of plans and drawings in the survey are identified and applied during survey plan development</p> |
| 2 Identify commercial vessel types and their structure | <p>2.1 <i>Basic factors determining design of commercial vessels are outlined</i></p> <p>2.2 Features of vessel designed to ensure its watertight and weather tight integrity are identified and maintained</p> <p>2.3 Survey or inspection plan relating to vessel design is identified and implemented</p> <p>2.4 Vessel construction methods and materials are identified and used as the basis to determine inspection and survey tasks</p> |
| 3 Interpret basic vessel stability criteria | <p>3.1 <i>Basic stability theory</i> as outlined in the National Standard for Commercial Vessels (NSCV) in relation to construction of a commercial vessel is accurately defined and basic stability calculations are performed</p> <p>3.2 Purpose of a vessel stability assessment is correctly explained</p> <p>3.3 Documentation and records required by surveyor to assess stability of vessel are identified and confirmed according to NSCV</p> |
| 4 Apply vessel construction theory to survey | <p>4.1 Different <i>types of vessel materials</i> are identified to determine scope of survey</p> <p>4.2 Survey plan appropriate to type of vessel is developed according to survey requirements and discussed with surveyor</p> <p>4.3 Feedback on survey plan is sought from others and possible changes or improvements are clarified where required and incorporated</p> |

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required Skills:

- Carry out calculations associated with vessel stability using basic stability criteria calculations
- Estimate, measure and calculate time required to complete tasks
- Interpret, apply and convey information verbally, in writing and diagrammatically
- Interpret numerical data
- Maintain documentation
- Read and interpret vessel specifications and drawings
- Record and report workplace information
- Work under supervision of a marine surveyor

Required Knowledge:

- Basic stability theory, and use and purpose of a vessel stability book
- Commercial vessel types and their structure
- Nomenclature relevant to vessel construction
- Other guidance such as:
 - Marine Orders
 - NSCV
 - Marine Safety (Domestic Commercial Vessel) National Law
- Principal design features of small vessels related to stability and watertight integrity
- Process of constructing commercial vessels
- Work health and safety (WHS)/occupational health and safety (OHS) legislation, policies and procedures

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, the required skills and knowledge, the range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the Elements, Performance Criteria, Required Skills, Required Knowledge and include:

- providing accurate and reliable information
- developing effective planning documents
- attention to detail when completing documentation
- performing accurate and reliable calculations.

Context of and specific resources for assessment

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

Resources for assessment include access to:

- industry-approved marine operations site where applying vessel construction theory to marine survey tasks can be conducted
- tools, equipment and personal protective equipment currently used in industry
- relevant regulatory and equipment documentation that impacts on work activities
- range of relevant exercises, case studies and/or other simulated practical and knowledge assessments
- appropriate range of relevant operational situations in the workplace.

In both real and simulated environments, access is required to:

- relevant and appropriate materials and equipment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals.

Method of assessment

Practical assessment must occur in an:

- appropriately simulated workplace environment and/or
- appropriate range of situations in the workplace.

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate to this unit:

- direct observation of the candidate applying vessel construction theory to marine survey tasks
- direct observation of the candidate applying relevant WHS/OHS requirements and work practices.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

In all cases where practical assessment is used it should be combined with targeted questioning to assess Required Knowledge.

Assessment processes and techniques must be appropriate to the language and literacy requirements of the work being performed and the capacity of the candidate.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below.

- Appropriate nomenclature may include:
 - All of the terms in the NSCV and referenced standards
- Commercial vessels may include:
 - Any vessel currently defined as a commercial vessel in Marine Safety (Domestic Commercial Vessel) National Law
- Plans and drawings may include:
 - Any plan as referred to in the NSCV
 - Bilge diagram
 - Cargo arrangement /tank plan
 - Docking plans
 - Fire and evacuation
 - General arrangement plan
 - Lines plan
 - Sections and views
 - Shell expansion plan
 - System operating procedures
- Basic factors must include:
 - Australian and New Zealand Standards
 - Class rules
 - NSCV
 - Uniform Shipping Laws (USL) Code
- Basic factors may include:
 - Framing requirements
 - Plating
 - Scantlings
- Basic stability theory may include:
 - Differences between transverse and longitudinal stability and causes of list and trim
 - Effects of density of sea water on draught and freeboard of a small vessel
 - Impact of design and hull shape on stability
 - Relationship between light displacement, loaded displacement and deadweight tonnage
 - Relationship between weight and buoyancy in relation to floating bodies reserve buoyancy equilibrium
 - Stability terms and definitions
 - Any other terms referred to in standard works on small ship naval architecture
- Types of vessel materials may include:
 - Ferrocement
 - Laminated materials and fabrics
 - Laminated timber

- Moulded fibre composites
- Riveting
- Welded and riveted
- Welded metal
- Wood
- Any other methods relevant to local commercial vessel market referred to in standard works on small craft construction

Unit Sector(s)

Not applicable.

Competency Field

Marine Surveying