



Australian Government

MARM016 Survey hull and superstructure of a commercial vessel

Release: 1

MARM016 Survey hull and superstructure of a commercial vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to undertake a survey of hull and superstructure of a commercial vessel according to relevant regulations. It includes planning survey, carrying out survey and providing survey report.

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 for survey task	1.1	Relevant standards for vessel hull and superstructure are accurately identified and accessed to support survey task
	1.2	Vessel survey regime is identified and relevant regulatory requirements, organisational requirements and procedures for survey scope are accessed and reviewed
	1.3	Vessel survey regime is confirmed against regulatory and organisational requirements
	1.4	Survey scope and depth is confirmed against relevant regulatory and organisational requirements

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| | 1.5 | Survey purpose, objectives and variations are discussed with relevant personnel |
| | 1.6 | Operational limits, certificate of operations and previous certificates of survey are reviewed to identify and take into consideration any special conditions, equivalent solutions, specific areas of operations and other regulatory limitations, exceptions or conditions that may impact on survey task |
| | 1.7 | Survey equipment and tools to carry out survey are accurately identified, selected and checked prior to survey |
| 2 Confirm hull type and material construction | 2.1 | Types of hull common to domestic commercial vessels are accurately identified and regulatory or additional standards are accessed and reviewed for use in survey |
| | 2.2 | Common materials used in hull construction and superstructure are identified and regulatory or additional standards are accessed and reviewed for use in survey |
| | 2.3 | Construction, type of hull and materials are confirmed prior to survey by accessing vessel records |
| 3 Conduct periodic survey of hull and superstructure | 3.1 | Survey of hull and superstructure is carried out according to regulatory requirements |
| | 3.2 | Changes to operational equipment or equivalent solutions are identified and examined for fitness both in or out of water as required by survey schedule |
| | 3.3 | Watertight openings and skin fittings are inspected for compliance |
| | 3.4 | Deformation and integrity of hull and superstructure are inspected for compliance |
| | 3.5 | Paint and coatings are inspected for condition |
| | 3.6 | Cathodic protection is inspected where applicable |
| | 3.7 | Superstructure weather tightness is checked for integrity |
| | 3.8 | Appendages are inspected for integrity |
| 4 Report and act on non-compliance | 4.1 | Non-compliance is detected, recorded and reported according to regulatory and organisational requirements |
| | 4.2 | Specialist support services are identified and sourced as appropriate |

- 4.3 Risks arising from detected non-compliance are reported and communicated to relevant personnel
- 4.4 Relevant provisions of legislation appropriate to level of risk detected are identified and followed
- 4.5 Appropriate reports and documentation relating to survey are developed and managed according to organisational and 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.

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| Relevant standards must include: | <ul style="list-style-type: none">• Australian/New Zealand Standards (AS/NZS)• class• manufacture guidelines• Marine Orders• National Standard for the Administration of Marine Safety (NSAMS) section 4• National Standard for Commercial Vessels (NSCV)• safety data sheets (SDS)/material safety data sheets (MSDS)• safety of life at sea (SOLAS)• Uniform Shipping Law (USL)• work health and safety/occupational health and safety (WHS/OHS) |
| Survey regime must include: | <ul style="list-style-type: none">• class of vessel• survey depth and level of vessel |
| Relevant regulatory requirements include one or more of the following: | <ul style="list-style-type: none">• AS/NZS, in particular:<ul style="list-style-type: none">• AS/NZS ISO 9001: 2008 Quality Management Systems – requirements• Marine Safety (Domestic Commercial Vessel) National Law |

	• NSAMS Section 4 • NSCV • Part B – General Requirements • Part C – Vessel Construction • Part E – Operational Practices
Survey scope and depth includes one or more of the following:	• condition • initial • modification/further building • periodic survey (in or out of water) • repair/damage
Survey equipment and tools include one or more of the following:	• communication equipment • draft survey hydrometer • drill • entry authority • hammer/welder's hammer • meat piercing thermometer • mirror • personal protective equipment such as respirators, gloves, overalls, boots, hearing protection, goggles, masks • photographs • plastic sampling bags • pocket calculator • recording equipment: • camera • dictaphone • lap top computer • notebook • sampling equipment: • silver nitrate test kit for chlorides • test kit equipment • thermometers • water-detecting paste • scraper • screwdriver • small mallet • sounding tapes • storage equipment/facilities • tape measure /measuring wheel
Types of hull include one or more of the following:	• box • catamaran

Domestic commercial vessels must include:	• foils • non water displacement • shallow draft • single • wave piercing • vessels defined as commercial vessels in Marine Safety (Domestic Commercial Vessel) National Law
Materials include one or more of the following:	• aluminium • cement • composite • fibreglass • steel • timber
Survey schedule include one or more of the following:	• twelve months • twenty-four months • thirty-months • five year cycle with NSAMS: • periodic survey (either annual or bi-annual) • change of class survey • safety equipment only survey • damage/repair or condition surveys • equivalent solution or deemed-to-satisfy surveys • SMS components • in water • out of water
Watertight openings and skin fittings include one or more of the following:	• cooling water systems • doppler log • drain plugs • hatch • inlet valve • sea chest • stabilisers
Deformation and integrity include one or more of the following:	• blisters • chemical attack • cracking • degradation • distortion • dry rot • isolated damage

- leaching
 - out of trim
 - structural failure
 - ultra violet (UV) breakdown
 - water ingress
 - weathering
- Paint and coatings include one or more of the following:
- anti fouling
 - copper sheathing
 - gel based
- Appendages include one or more of the following:
- bilge keels
 - keel coolers
 - rudders
 - stabilisers
- Specialist support services include one or more of the following:
- analytical laboratories
 - chemical (sewage systems)
 - electrical
 - naval architects
 - non-destructive evaluation (NDE) services
 - noise
 - pressure vessel testing
- Appropriate reports and documentation include one or more of the following:
- certificate of operation
 - certificate of survey
 - statements of compliance
 - survey report

Unit Mapping Information

This unit replaces and is equivalent to MARM5006A Survey hull and superstructure of a commercial vessel

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 MARM016 Survey hull and superstructure of a commercial vessel

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 and performance criteria.

Survey of hull and superstructure of a commercial vessel should be undertaken in at least three or more contexts and include:

- analysing and evaluating available data and observations to form logical conclusions
- applying relevant work health and safety/occupational health and safety (WHS/OHS) requirements and work practices
- carrying out engineering measurements and applying metric and imperial conversions
- communicating effectively with others as required verbally and in writing
- developing and using research techniques to identify gaps in knowledge and to recognise professional development opportunities
- developing effective planning documents
- disseminating and clarifying technical information
- identifying strengths, weaknesses and failure modes of common marine construction materials
- implementing relevant WHS/OHS requirements, work practices and protection of the marine environment
- interpreting engineering drawings
- interpreting relevant legislation, regulations, codes of practice, standards and rules
- managing risks
- providing customer service
- providing high quality reports
- recognising own professional limitations
- undertaking research and analysis using relevant reference material
- using computers
- working independently and unsupervised
- writing technical reports.

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:

- acoustic and thermal insulation principles and practices
- awareness of working stresses in vessel under load or in a seaway
- basic principles of stability, procedures for incline experiments, simple roll test, stable and unstable equilibrium
- commercial vessel classifications and survey requirements for various areas of operations
- compatibility and durability of construction materials
- composite production methods, quality assurance and secondary bonding techniques
- damage propagation caused by defects, poor engineering practice and/or transmission of dynamic forces
- documentation and checklists:
 - construction drawings
 - defect list
 - historical records
 - National Standard for the Administration of Marine Safety (NSAMS) Section 4
 - procedural forms
 - safety management systems
 - stability book
 - standard operating procedures
 - Uniform Shipping Laws (USL) Section 14 Appendix 2
 - vessel files
- elementary ergonomic design principals and methods for reducing harm to crew in a seaway
- environmental controls and regulations
- forms, causes and prevention of corrosion in a marine environment
- galvanic series of common metals used in boat building
- hull forms and vessel types
- implications of poor ventilation practice
- insurance, liability and professional indemnity
- interaction of vessel structures, mechanical systems and appropriate installation practices
- maintaining watertight integrity
- marine craft construction:
 - methods, materials and vessel anatomy
 - terminology and definitions
- marine-grade adhesives, mechanical fasteners, sealants and caulking materials
- marine protective coatings, fairing compounds and finishes
- principles of sheathing
- repair techniques and maintenance procedures for common marine craft construction materials

- report writing formats
- safe working practices and risk assessment procedures
- suitable structural support for out-of-water vessels to prevent topple, sag, hog and/or damage from local stress concentrations
- welding techniques, procedures and standards
- WHS/OHS legislation, policies and procedures.

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 simulated workplace operational situations or an industry-approved marine operations site that replicates workplace conditions, where a survey of hull and superstructure of a commercial vessel can be conducted.

Resources for assessment include access to:

- relevant documentation including workplace procedures, regulations, codes of practice and operation manuals
- tools, equipment and personal protective equipment currently used in industry used when surveying a hull and superstructure of a commercial vessel.

Performance should be 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>