



Australian Government

MAR Maritime Training Package

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MAR10313 Certificate I in Maritime Operations (General Purpose Hand Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people working in entry level positions in the maritime industry as a General Purpose Hand on deck or in the engine room of a vessel up to 80 metres within the exclusive economic zone (EEZ) or in the engine room only for a vessel with propulsion power up to 3000 kW.

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a General Purpose Hand Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR10313 Certificate I in Maritime Operations (General Purpose Hand Near Coastal) and an Australian Maritime Safety Authority (AMSA) approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 8 units

8 core units

MARB001	Assist with routine maintenance of a vessel
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft

MARG001	Work effectively as part of a crew on a vessel up to 80 metres
MARN001	Apply general purpose hand skills aboard a vessel
MARO001	Perform basic lookout duties

Qualification Mapping Information

This qualification is equivalent to MAR10113 Certificate I in Maritime Operations (General Purpose Hand).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR10413 Certificate I in Maritime Operations (Coxswain Grade 2 Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work as a Coxswain Grade 2 Near Coastal in the maritime industry and:

- command a commercial marine vessel:
 - up to 12 metres in length
 - with propulsion power that is unlimited for an outboard engine or up to 100 kW for an inboard engine
 - that is not carrying passengers
- operate this vessel
 - in sheltered waters or
 - as a tender or auxiliary vessel within 3 nautical miles (nm) of a parent vessel within the exclusive economic zone (EEZ) or
 - within 3 nm from point of departure, shore base or aquaculture lease.

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Coxswain Grade 2 Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR10413 Certificate I in Maritime Operations (Coxswain Grade 2 Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service, and AMSA final assessment; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 8 units

8 core units

MARC005	Operate inboard and outboard motors
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARI001	Comply with regulations to ensure safe operation of a vessel up to 12 metres
MARJ001	Follow environmental work practices
MARK001	Handle a vessel up to 12 metres
MARN002	Apply seamanship skills aboard a vessel up to 12 metres

Qualification Mapping Information

No equivalent qualification.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR20313 Certificate II in Maritime Operations (Coxswain Grade 1 Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work as a Coxswain Grade 1 Near Coastal in the maritime industry and:

- command a commercial marine vessel:
 - up to 12 metres in length
 - with propulsion power that is unlimited for an outboard engine or up to 500 kW for an inboard engine
- carry passengers on this vessel:
 - inshore or
 - as a tender or auxiliary vessel within 3 nautical miles (nm) of a parent vessel within the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Coxswain Grade 1 Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR20313 Certificate II in Maritime Operations (Coxswain Grade 1 Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service, AMSA final assessment, an appropriate radio certificate of proficiency and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 12 units

12 core units

MARB002	Perform basic servicing and maintenance of main propulsion unit and auxiliary systems
MARC005	Operate inboard and outboard motors
MARC006	Operate main propulsion unit and auxiliary systems
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft
MARH001	Plan and navigate a passage for a vessel up to 12 metres
MARI001	Comply with regulations to ensure safe operation of a vessel up to 12 metres
MARJ001	Follow environmental work practices
MARK001	Handle a vessel up to 12 metres
MARN002	Apply seamanship skills aboard a vessel up to 12 metres

Qualification Mapping Information

This qualification is equivalent to MAR20113 Certificate II in Maritime Operations (Coxswain).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR20413 Certificate II in Maritime Operations (Marine Engine Driver Grade 3 Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work in the maritime industry operating as Chief Engineer on vessels with propulsion power up to 500 kW and Second Engineer on vessels with propulsion power up to 750 kW, in the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Marine Engine Driver Grade 3 Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR20413 Certificate II in Maritime Operations (Marine Engine Driver Grade 3 Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service or qualifying sea service and a workshop skill equivalent qualification, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 12 units

12 core units

BSBWOR203B	Work effectively with others
MARB003	Service marine internal combustion engines, and propulsion and auxiliary systems
MARC001	Complete engine room tasks
MARC002	Maintain hull out of water

MARC003	Operate and maintain extra low and low voltage electrical systems and equipment
MARC004	Operate deck machinery
MARC007	Operate marine internal combustion engines, and propulsion and auxiliary systems
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft
MARJ001	Follow environmental work practices

Qualification Mapping Information

This qualification is equivalent to MAR20213 Certificate II in Maritime Operations (Marine Engine Driver Grade 3).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR30813 Certificate III in Maritime Operations (Marine Engine Driver Grade 2 Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work in the maritime industry operating as Chief Engineer on vessels with propulsion power up to 750 kW and Second Engineer on vessels with propulsion power up to 1500 kW in the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Marine Engine Driver Grade 2 Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR30813 Certificate III in Maritime Operations (Marine Engine Driver Grade 2 Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service or qualifying sea service and a workshop skill equivalent qualification, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 16 units

16 core units

BSBWOR203B	Work effectively with others
MARB006	Maintain marine internal combustion engines, propulsion plant and auxiliary systems
MARB007	Undertake basic maintenance of electrical systems
MARC001	Complete engine room tasks

MARC002	Maintain hull out of water
MARC003	Operate and maintain extra low and low voltage electrical systems and equipment
MARC004	Operate deck machinery
MARC007	Operate marine internal combustion engines, and propulsion and auxiliary systems
MARC008	Manage fuel systems
MARC009	Operate and monitor marine internal combustion engines, propulsion plant and auxiliary systems
MARC010	Operate electrical systems
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft
MARJ001	Follow environmental work practices

Qualification Mapping Information

This qualification is equivalent to MAR30213 Certificate III in Maritime Operations (Marine Engine Driver Grade 2).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR30913 Certificate III in Maritime Operations (Master up to 24 metres Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people working in the maritime industry as a Master on commercial vessels up to 24 metres in length within the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Master up to 24 metres Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR30913 Certificate III in Maritime Operations (Master up to 24 metres Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service, an appropriate radio certificate of proficiency, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 14 units

14 core units

BSBFLM303C	Contribute to effective workplace relationships
MARB004	Perform routine maintenance on a vessel up to 24 metres
MARB005	Slip or dock a vessel and maintain hull on a vessel up to 80 metres
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel

MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft
MARH003	Manage and maintain a navigational watch on board vessels up to 80 metres
MARH004	Plan and navigate a passage for a vessel up to 80 metres
MARH005	Use wheelhouse equipment for safe navigation
MARI002	Observe regulations to ensure safe operation of a vessel up to 80 metres
MARJ002	Monitor environmental management on a vessel
MARK002	Manoeuvre a vessel up to 24 metres within near coastal waters
MARN003	Perform seamanship operations on board a vessel up to 24 metres

Qualification Mapping Information

This qualification is equivalent to MAR30413 Certificate III in Maritime Operations (Master up to 24 metres).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR31013 Certificate III in Maritime Operations (Master Inland Waters)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people working in the maritime industry as a Master Inland Waters on commercial vessels up to 24 metres in length.

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Master Inland Waters as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR31013 Certificate III in Maritime Operations (Master Inland Waters), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 12 units

12 core units

BSBFLM303C	Contribute to effective workplace relationships
MARB004	Perform routine maintenance on a vessel up to 24 metres
MARB005	Slip or dock a vessel and maintain hull on a vessel up to 80 metres
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel

MARF004	Meet work health and safety requirements
MARH002	Apply weather information when navigating inland waters as Master
MARH003	Manage and maintain a navigational watch on board vessels up to 80 metres
MARI002	Observe regulations to ensure safe operation of a vessel up to 80 metres
MARJ002	Monitor environmental management on a vessel
MARK002	Manoeuvre a vessel up to 24 metres within near coastal waters
MARN003	Perform seamanship operations on board a vessel up to 24 metres

Qualification Mapping Information

This qualification is equivalent to MAR30513 Certificate III in Maritime Operations (Master Inland Waters).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR40513 Certificate IV in Maritime Operations (Marine Engine Driver Grade 1 Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work in the maritime industry operating as Chief Engineer on vessels with propulsion power up to 1500 kW and Second Engineer on vessels with propulsion power up to 3000 kW in the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Marine Engine Driver Grade 1 Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR40513 Certificate IV in Maritime Operations (Marine Engine Driver Grade 1 Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service or qualifying sea service and a workshop skill equivalent qualification, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 27 units

27 core units

BSBWOR203B	Work effectively with others
MARA004	Manage vessel stability
MARB007	Undertake basic maintenance of electrical systems
MARB008	Carry out basic welding, brazing, cutting and machining operations on a coastal vessel

MARB009	Manage refuelling
MARB011	Undertake maintenance of 240 to 440 voltage alternating current electrical systems
MARB012	Undertake maintenance of machinery, machinery systems and structural components
MARC001	Complete engine room tasks
MARC002	Maintain hull out of water
MARC003	Operate and maintain extra low and low voltage electrical systems and equipment
MARC004	Operate deck machinery
MARC007	Operate marine internal combustion engines, and propulsion and auxiliary systems
MARC008	Manage fuel systems
MARC009	Operate and monitor marine internal combustion engines, propulsion plant and auxiliary systems
MARC010	Operate electrical systems
MARC013	Operate auxiliary machinery systems up to 1500 kW
MARC015	Operate marine internal combustion engines and associated systems up to 1500 kW
MARC016	Operate propulsion transmission systems up to 1500 kW
MARC017	Operate 240 to 440 voltage alternating current electrical systems
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft
MARG003	Manage an engine room and small engineering team
MARJ001	Follow environmental work practices
MARJ002	Monitor environmental management on a vessel

MARL001 Carry out engineering calculations

Qualification Mapping Information

This qualification is equivalent to MAR40213 Certificate IV in Maritime Operations (Marine Engine Driver Grade 1).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR40613 Certificate IV in Maritime Operations (Master up to 35 metres Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for those sailing as Master on vessels up to 35 metres in length within the exclusive economic zone (EEZ) or a Mate on vessels up to 80 metres in length.

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Master up to 35 metres Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification as a Master less than 35 metres Near Coastal (as defined by the NSCV Part D) will require achievement of the MAR40613 Certificate IV in Maritime Operations (Master up to 35 metres Near Coastal), certification as a Master less than 24 metres Near Coastal, an appropriate radio certificate of proficiency, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with the Australian Maritime Safety Authority (AMSA).

This level of qualification is also currently cited as meeting some of the requirements for certification as a Mate less than 80 metres Near Coastal as defined by the NSCV Part D.

Certification as a Mate less than 80 metres Near Coastal will require achievement of the MAR40613 Certificate IV in Maritime Operations (Master up to 35 metres Near Coastal), qualifying sea service and completed AMSA approved task book or qualifying sea service, an appropriate radio certificate of proficiency, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 21 units

21 core units

MARA003	Manage loading, discharging and stowage of cargo
MARA004	Manage vessel stability
MARB005	Slip or dock a vessel and maintain hull on a vessel up to 80 metres
MARB010	Plan and supervise routine maintenance on a vessel up to 80 metres
MARC011	Manage a propulsion unit using appropriate engine systems and support services
MARC012	Monitor and manage vessel operations
MARC014	Operate deck machinery and steering gear on a vessel up to 80 metres
MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft
MARF010	Work safely in confined spaces on a vessel
MARG002	Manage a small crew
MARH003	Manage and maintain a navigational watch on board vessels up to 80 metres
MARH004	Plan and navigate a passage for a vessel up to 80 metres
MARH005	Use wheelhouse equipment for safe navigation
MARH006	Forecast weather and oceanographic conditions
MARI002	Observe regulations to ensure safe operation of a vessel up to 80 metres
MARJ002	Monitor environmental management on a vessel
MARK003	Manoeuvre a vessel up to 80 metres
MARN004	Manage seaworthiness of a vessel up to 80 metres

Qualification Mapping Information

This qualification is equivalent to MAR40313 Certificate IV in Maritime Operations (Master up to 35 metres).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR50613 Diploma of Maritime Operations (Marine Engineering Class 3 Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work in the maritime industry as a Chief Engineer on vessels with propulsion power up to 3000 kW in the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as an Engineer Class 3 Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR50613 Diploma of Maritime Operations (Marine Engineering Class 3 Near Coastal), qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service or qualifying sea service and a workshop skill equivalent qualification, AMSA final assessment and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Certification will also require either MAR40513 Certificate IV in Maritime Operations (Marine Engine Driver Grade 1 Near Coastal) or a trade (as specified in NSCV Part D).

Entry Requirements

Not applicable.

Packaging Rules

Total number of units = 15 units

15 core units

MARE001	Communicate effectively when performing engineering duties

MARF003	Follow vessel security procedures

MARF006	Observe personal safety and social responsibility
MARF008	Prevent and fight fires on board a vessel
MARF009	Survive at sea in the event of vessel abandonment
MARF010	Work safely in confined spaces on a vessel
MARJ003	Ensure compliance with environmental management legislation
MARL002	Apply basic principles of naval architecture
MARL003	Demonstrate basic knowledge of marine auxiliary boilers
MARL004	Demonstrate basic knowledge of marine auxiliary machinery and equipment
MARL005	Demonstrate basic knowledge of marine control systems and automation
MARL006	Demonstrate basic knowledge of marine diesel engines and systems
MARL007	Demonstrate basic knowledge of marine electrical systems
MARL008	Demonstrate basic knowledge of ships and ship routines
MARL009	Perform basic marine engineering calculations

Qualification Mapping Information

This qualification is equivalent to MAR50113 Diploma of Maritime Operations (Marine Engineering Class 3).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR50713 Diploma of Maritime Operations (Master up to 80 metres Near Coastal)

Modification History

Release 1. New qualification.

Qualification Description

This qualification is suitable for people who work in the maritime industry as a Master on vessels up to 80 metres operating in near coastal waters within the exclusive economic zone (EEZ).

Licensing/Regulatory Information

This level of qualification is currently cited as meeting some of the requirements for certification as a Master up to 80 metres Near Coastal as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Certification will require achievement of the MAR50713 Diploma of Maritime Operations (Master up to 80 metres Near Coastal), certification as a Master less than 35 metres Near Coastal, qualifying sea service and completed Australian Maritime Safety Authority (AMSA) approved task book or qualifying sea service, AMSA final assessment, an appropriate radio certificate of proficiency and an AMSA approved first aid certificate; people seeking certification should check with AMSA.

Entry Requirements

MAR40613 Certificate IV in Maritime Operations (Master up to 35 metres Near Coastal)

Packaging Rules

Total number of units = 25 units

25 core units

MARA001	Contribute to safe cargo operations on liquefied gas tankers
MARA002	Contribute to safe cargo operations on oil and chemical tankers
MARA005	Maintain vessel stability
MARA006	Monitor loading, unloading and stowage of cargo

MARD001	Manage business and administration on vessels limited by tonnage or near coastal operations
MARD002	Manage operations and maintenance on vessels limited by tonnage or near coastal operations
MARF003	Follow vessel security procedures
MARF006	Observe personal safety and social responsibility
MARF008	Prevent and fight fires on board a vessel
MARF009	Survive at sea in the event of vessel abandonment
MARF010	Work safely in confined spaces on a vessel
MARF011	Manage firefighting and fire prevention activities on board a vessel
MARF012	Control safe access to and on vessel
MARF014	Respond to emergencies
MARG004	Provide leadership to crew
MARH007	Apply command navigation procedures on vessels limited by tonnage or near coastal operations
MARH008	Plan and conduct a passage
MARH009	Use an electronic chart display and information system to navigate safely
MARH010	Use bridge equipment to determine vessel position
MARJ003	Ensure compliance with environmental management legislation
MARJ004	Inspect and report defects and damage to vessel
MARK004	Perform basic vessel manoeuvres
MARN005	Maintain seaworthiness of a vessel
MARO002	Maintain a safe navigational watch
MARO004	Transmit and receive information by visual signalling

Qualification Mapping Information

No equivalent qualification.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

BSBFLM303C Contribute to effective workplace relationships

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to gather information and maintain effective working relationships and networks, with particular regard to communication and representation. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	Frontline managers have a key role in contributing to efficient and effective work teams within the context of the organisation. They play a prominent part in motivating, mentoring, coaching and developing team cohesion through providing leadership for the team and forming the bridge between the management of the organisation and the team members. At this level, work will normally be carried out within known routines, methods and procedures which require the exercise of some discretion and judgement. This unit is related to BSBWOR401A Establish effective workplace relationships.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Prerequisite units		

Employability Skills Information

Employability skills	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 performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Seek, receive and communicate information and ideas	1.1. Collect information associated with the achievement of work responsibilities from appropriate sources 1.2. Communicate ideas and information to diverse audiences in an appropriate and sensitive manner 1.3. Seek contributions from internal and external sources to develop and refine new ideas and approaches in accordance with organisational processes 1.4. Facilitate consultation processes to allow employees to contribute to issues related to their work, and promptly communicate outcomes of consultation to the work team 1.5. Promptly deal with and resolve issues raised, or refer them to relevant personnel
2. Encourage trust and	2.1. Treat people with integrity, respect and empathy

ELEMENT	PERFORMANCE CRITERIA
confidence	2.2. Encourage effective relationships within the framework of <i>the organisation's social, ethical and business standards</i> 2.3. Gain and maintain the trust and confidence of <i>colleagues, customers and suppliers</i> through competent performance 2.4. Adjust interpersonal styles and methods in relation to the organisation's social and cultural environment
3. Identify and use networks and relationships	3.1. Identify and utilise <i>workplace networks</i> to help build relationships 3.2. Identify and describe the value and benefits of networks and other work relationships for the team and the organisation
4. Contribute to positive outcomes	4.1. Identify difficulties and take action to rectify the situation within own level of responsibility according to organisational and legal requirements 4.2. Support colleagues in resolving work difficulties 4.3. Regularly review <i>workplace outcomes</i> and implement improvements in consultation with relevant personnel 4.4. Identify and resolve <i>poor work performance</i> within own level of responsibility and according to organisational policies 4.5. Deal constructively with conflict, within the organisation's established processes

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities
- coaching and mentoring skills to provide support to colleagues
- functional literacy skills to access and use workplace information
- relationship management and communication skills to:
 - interpret information from a variety of people
 - respond to unexpected demands from a range of people

REQUIRED SKILLS AND KNOWLEDGE

- gain the trust and confidence of colleagues
- deal with people openly and fairly
- forge effective relationships with internal and/or external people.

Required knowledge

- principles and techniques associated with relationship management, including:
 - developing trust and confidence
 - behaving consistently in work relationships
 - identifying the cultural and social environment
 - identifying and assessing interpersonal styles
 - establishing networks
 - identifying and resolving problems
 - handling conflict
 - managing poor work performance
 - monitoring and improving work relationships
 - using anti-discrimination/bias strategies and making contributions
- relevant legislation from all levels of government that may affect business operation, especially in regard to:
 - occupational health and safety and environmental issues
 - equal opportunity
 - industrial relations
 - anti-discrimination.

Evidence Guide**EVIDENCE GUIDE**

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

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

Evidence of the following is essential:

- using culturally appropriate communication techniques to share work-based information with teams and individuals in accordance with organisation policies
- developing networks and building team relationships

EVIDENCE GUIDE	
	regularly reviewing workplace outcomes to identify and resolve issues and implement improvements within own level of responsibility and according to organisational policies.
Context of and specific resources for assessment	Assessment must ensure: access to appropriate documentation and resources normally used in the workplace.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: - direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate - oral or written questioning to assess knowledge and understanding of principles of relationship management and organisation's social, ethical and business standards - presentation of examples of actions taken by the candidate to build networks and contribute to positive workplace relationships and outcomes.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: other management or frontline management units.

Range Statement

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. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Information may include:	- archived, filed and historical background data - electronic or manual transmission - individual and team performance data - marketing and customer-related data

RANGE STATEMENT	
	• organisation policies and procedures • planning and organisational documents including the outcomes of continuous improvement and quality assurance • written or verbal communications
Sources of information may be:	• external, such as: • external customers • web based resources • reports • internal, such as: • supervisors, managers and peers • organisation policies and procedures • workplace documents
Diverse audiences may include:	• persons with specific social, cultural and other needs that require a range of strategies and approaches including adjusting communication
Consultation processes may include:	• feedback to the work team and relevant personnel in relation to outcomes of the consultation process • opportunity for employees to contribute ideas and information
Relevant personnel may include:	• OHS committees and OHS representatives • people with specialist responsibilities • supervisors, managers and other employees • union representatives/groups
The organisation's social, ethical and business standards may refer to:	• implied standards such as honesty and respect relative to the organisation culture and generally accepted within the wider community • rewards and recognition for high performing staff • standards expressed in legislation and regulations such as anti-discrimination legislation • written standards such as those expressed in: • vision and mission statements • policies • code of workplace conduct/behaviour • dress code • statement of workplace values

RANGE STATEMENT	
Colleagues, customers and suppliers may include:	- employees at the same level and more senior managers - internal and external contacts - people from a wide variety of social, cultural and ethnic backgrounds - team members
Workplace networks may be:	- formal or informal - individuals or groups - internal or external - structured or unstructured
Workplace outcomes may include:	- OHS processes and procedures - performance of the work team
Poor work performance may relate to:	self or work team; or it may extend to the organisation as a whole

Unit Sector(s)

Unit sector	

Competency field

Competency field	Management and Leadership - Frontline Management

Co-requisite units

Co-requisite units		

BSBWOR203B Work effectively with others

Modification History

Release	Comments
Release 1	This version first released with <i>BSB07 Business Training Package version 6.0</i>. Revised unit. Required knowledge and Range Statement changed to include environmentally sustainable practices Replaces BSBWOR203A Work effectively with others

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to work in a group environment promoting team commitment and cooperation, supporting team members and dealing effectively with issues, problems and conflict.

Application of the Unit

This unit applies to individuals who perform a range of routine tasks using a limited range of practical skills and fundamental knowledge of teamwork in a defined context under direct supervision or with limited individual responsibility.

Licensing/Regulatory Information

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

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria

Element	Performance Criteria
<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</i>

Elements and Performance Criteria

1. Develop effective workplace relationships	1.1 Identify own responsibilities and duties in relation to workgroup members and undertake activities in a manner that promotes cooperation and good relationships 1.2 Take time and resource constraints into account in fulfilling work requirements of self and others 1.3 Encourage, acknowledge and act upon constructive feedback provided by others in the workgroup
2. Contribute to workgroup activities	2.1 Provide support to team members to ensure workgroup goals are met 2.2 Contribute constructively to workgroup goals and tasks according to organisational requirements 2.3 Share information relevant to work with workgroup to ensure designated goals are met 2.4 Identify and plan strategies/opportunities for improvement of workgroup in liaison with workgroup
3. Deal effectively with issues, problems and conflict	3.1 Respect differences in personal values and beliefs and their importance in the development of relationships 3.2 Identify any linguistic and cultural differences in communication styles and respond appropriately 3.3 Identify issues, problems and conflict encountered in the workplace 3.4 Seek assistance from workgroup members when issues, problems and conflict arise and suggest possible ways of dealing with them as appropriate or refer them to the appropriate person

Required Skills and Knowledge

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

Required skills

- literacy skills to read and understand the organisation's policies and work procedures, to write simple instructions for particular routine tasks and to interpret information gained from correspondence
- communication skills to request advice, to receive feedback and to work with a team
- technology skills to select and use technology appropriate to a task
- culturally appropriate communication skills to relate to people from diverse backgrounds and people with diverse abilities.

Required knowledge

- key provisions of relevant legislation from all levels of government that may affect aspects of business operations, such as:
 - anti-discrimination legislation
 - ethical principles
 - codes of practice
 - privacy laws
 - occupational health and safety (OHS)
 - environmentally sustainable work practices
- organisational policies, plans and procedures
- workgroup member responsibilities and duties, and relationship to individual responsibilities and duties.

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • providing support to team members to ensure goals are met • seeking feedback from clients and/or colleagues and taking appropriate action • knowledge of appropriate conflict resolution techniques.

Context of and specific resources for assessment	Assessment must ensure: • access to an actual workplace or simulated environment • access to office equipment and resources • examples of customer complaints or staff conflict.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate • analysis of responses to case studies and scenarios • demonstration of techniques • observation of demonstrated techniques in resolving conflict • observation of presentations • review of documentation identifying and planning strategies/opportunities for workgroup improvement.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • interpersonal communication units • other industry capability units.

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. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Responsibilities and duties</i> may include:	• Code of Conduct • job description and employment arrangements • organisation's policy relevant to work role • skills, training and competencies • supervision and accountability requirements including OHS • environmentally sustainable working practices • team structures.

Workgroup members may include:	• coach/mentor • other members of the organisation • peers/work colleagues/team/enterprise • supervisor or manager.
Feedback on performance may include:	• formal/informal performance appraisals • obtaining feedback from clients • obtaining feedback from supervisors and colleagues • personal, reflective behaviour strategies • routine organisational methods for monitoring service delivery.
Support to team members may include:	• explaining/clarifying • helping colleagues • problem-solving • providing encouragement • providing feedback to a team member • undertaking extra tasks if necessary.
Information to be shared may include:	• acknowledging satisfactory performance • acknowledging unsatisfactory performance • assisting a colleague • clarifying the organisation's preferred task completion methods • encouraging colleagues • open communication channels • workplace hazards, risks and controls.
Strategies/opportunities for improvement may include:	• career planning/development • coaching, mentoring and/or supervision • formal/informal learning programs • internal/external training provision • performance appraisals • personal study • recognition of current competence (RCC)/skills recognition/initial assessment • work experience/exchange/opportunities • workplace skills assessment.

Unit Sector(s)

Industry Capability – Workplace Effectiveness

Custom Content Section

Not applicable.

MARAO01 Contribute to safe cargo operations on liquefied gas tankers

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to recognise hazards associated with liquefied gas tankers and to apply appropriate hazard control measures to ensure safe cargo operation.

This unit applies to seafarers required to assist in the safe operation of a liquefied gas tanker.

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 Determine characteristics of tanker cargo and tankers to ensure safe transfer and transport of cargo	1.1	Features of various types of liquefied gas tankers are outlined
	1.2	Cargo operations of tankers are identified
	1.3	Properties of cargo being transported are identified and their impact on safety, the environment and vessel operations are outlined

	1.4	Hazards associated with the transport of cargo are clarified according to emergency response documentation
	1.5	Hazard controls associated with tanker cargo are employed according to organisational procedures
2 Comply with legislative and organisational requirements for safe transfer and transport of tanker cargo	2.1	Safety data sheets (SDS)/material safety data sheets (MSDS) relevant to cargo are accessed and procedures for tanker safety and safety management are identified
	2.2	SDS/MSDS are interpreted to identify relevant cargo-related hazards to the vessel and to personnel
	2.3	Legislative and organisational requirements are interpreted to identify appropriate actions for safe transfer and transport of cargo
3 Take precautions to prevent hazards	3.1	Organisational policies and procedures to minimise hazards are identified
	3.2	Type and severity of the hazard posed by cargo is recognised
	3.3	Transfer and transport of cargo is monitored to prevent hazards
	3.4	Gas monitoring equipment is regularly inspected and used according to organisational procedures
4 Act on becoming aware of a hazardous situation	4.1	Source of hazard is identified according to organisational procedures
	4.2	Risk is assessed considering severity and likelihood of consequences
	4.3	Control measures to minimise risk are implemented to level of responsibility or referred to appropriate person for further action
	4.4	Containment procedures are applied where appropriate
	4.5	Appropriate safety procedures are followed and personal protective equipment is used according to organisational procedures
	4.6	Risk is eliminated where possible, and if not practical, actions are taken to control risk
5 Take precautions to prevent pollution of	5.1	Procedures to prevent pollution are identified and observed at all times

**the environment
from release of
liquefied gases**

- 5.2 Measures to prevent pollution during normal and emergency situations are applied according to regulatory requirements and organisational procedures
- 5.3 All relevant information is immediately reported to appropriate persons when a vapour leak or cloud is detected or a malfunction has occurred that poses a risk of a vapour leak or cloud
- 5.4 Shore-based response personnel are promptly notified when a vapour leak or cloud occurs

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.

Cargo operations must include:

- cargo handling equipment
- emergency shut-down system (ESS)
- loading, unloading and care in transit
- piping systems and valves
- tank cleaning, purging, gas-freeing and inerting

Properties must include:

- chemical symbols
- pressure and temperature including vapour pressure/temperature relationship
- types of electrostatic charge generation

Cargo must include:	• ammonia • butadiene • ethylene • liquefied natural gas (LNG) • liquefied petroleum gas (LPG) • propylene • vinyl chloride
Hazards must include:	• corrosion hazards • electrostatic hazards • environmental hazards • explosion and flammability hazards • extremely low temperatures • health hazards • pressure hazards • reactivity hazards • sources of ignition • toxicity hazards • vapour leaks and clouds
Hazard controls must include:	• anti-static measures • atmospheric control • cargo inhibition • gas testing • importance of cargo compatibility • inerting, drying and monitoring techniques • segregation • ventilation
Gas monitoring equipment must include:	• gas monitoring instruments • oxygen indicators
Firefighting equipment must include:	• firefighting agents • fixed dry chemical systems • fixed foam systems • portable foam systems

- Measures must include:
- assisting in implementing shipboard spill containment procedures
 - reporting relevant information to the responsible person

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA3001A Contribute to safe cargo operations on liquefied gas tankers.

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 MARA001 Contribute to safe cargo operations on liquefied gas tankers

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 on at least one occasion and include:

- communicating clearly and effectively
- correctly identifying safety data sheets (SDS)/material safety data sheets (MSDS), relevant cargo-related hazards to vessel and to personnel, and taking appropriate action according to organisational procedures
- ensuring cargo operations are carried out according to accepted principles and procedures to ensure safety of operations
- identifying and acting on becoming aware of a hazardous situation, according to organisational procedures
- interpreting and applying knowledge of liquefied gas tanker layouts, tanker cargo features, characteristics and hazards, and related hazard prevention strategies to duties on various types of liquefied gas tankers
- reading and interpreting SDS/MSDS
- recognising problems and hazards that can arise when managing safety on a liquefied gas tanker, taking appropriate remedial action and initiating appropriate solutions.

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:

- anti-static measures in hazard control
- atmospheric control
- cargo handling equipment
- cargo inhibition in hazard control
- corrosion hazards associated with tanker operations
- emergency shut-down system (ESD)
- environmental hazards associated with tanker operations
- explosion and flammability hazards associated with tanker operations
- extremely low temperatures associated with tanker operations
- gas testing

- general arrangement and construction of liquefied gas tankers
- health hazards associated with tanker operations
- importance of cargo compatibility
- inerting, drying and monitoring techniques in hazard control
- information on a SDS/MSDS
- loading, unloading and care in transit
- piping systems and valves
- pressure and temperature, including vapour pressure/temperature relationship
- pressure hazards associated with tanker operations
- properties and characteristics of liquefied gas
- reactivity hazards associated with tanker operations
- relevant chemical symbols
- relevant firefighting operations and the use of firefighting installations
- segregation in hazard control
- sources of ignition associated with tanker operations
- tanker cleaning, purging, gas-freeing and inerting
- tanker safety culture and safety management
- types of electrostatic charge generation
- types of liquefied gas tankers
- vapour leaks and clouds associated with tanker operations
- ventilation in hazard control
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARA002 Contribute to safe cargo operations on oil and chemical tankers

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to recognise hazards associated with oil and chemical tankers and apply appropriate hazard control measures to ensure safe cargo operation.

This unit applies to seafarers required to assist in the safe operation of oil and chemical tankers.

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 Recognise characteristics of tanker cargo and tankers to ensure the safe transfer and transport of cargo	1.1	Features of various types of oil and chemical tankers are outlined
	1.2	Cargo operations of tankers are identified
	1.3	Properties of cargo being transported are identified and their impact on safety, the environment and vessel operations is

		recognised
	1.4	Hazards associated with the transport of cargo are clarified according to emergency response documentation
	1.5	Hazard controls associated with tanker cargo are employed according to organisational procedures
2	Comply with legislative and organisational requirements for safe transfer and transport of tanker cargo	
	2.1	Safety data sheets (SDS)/material safety data sheets (MSDS) relevant to cargo are accessed and procedures for tanker safety and safety management are identified
	2.2	SDS/MSDS are interpreted to identify relevant cargo-related hazards to the vessel and to personnel
	2.3	Legislative and organisational requirements are interpreted to identify appropriate actions for safe transfer and transport of cargo
3	Take precautions to prevent hazards	
	3.1	Organisational policies and procedures to minimise hazards are identified
	3.2	Type and severity of hazard posed by cargo is recognised
	3.3	Transfer and transport of cargo is monitored to prevent hazards
	3.4	Monitoring equipment , where installed, is regularly inspected and used according to organisational procedures
4	Act on becoming aware of a hazardous situation	
	4.1	Source of hazard is identified according to organisational procedures
	4.2	Risk is assessed considering severity and likelihood of consequences
	4.3	Control measures to minimise risk are implemented to level of responsibility or referred to appropriate person for permission or further action
	4.4	Containment procedures are applied where appropriate
	4.5	Appropriate safety procedures are followed and personal protective equipment is used according to organisational procedures
	4.6	Risk is eliminated where possible, and if not practical, actions are taken to control risk
	4.7	Appropriate firefighting equipment is identified to carry out

firefighting operations

5 Take precautions to prevent pollution of the environment from the release of oil or chemicals	5.1	Procedures to prevent pollution are identified and observed at all times
	5.2	Measures to prevent pollution during normal and emergency situations are applied according to regulatory requirements and organisational procedures
	5.3	All relevant information is immediately reported to appropriate persons when a spill is detected or a malfunction has occurred that poses a risk of a spill
	5.4	All required spill containment procedures are correctly implemented according to regulatory requirements and 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.

Features of various types of oil and chemical tankers must include:

- general arrangement and construction
- types of oil and chemical tankers

Cargo operations must include:

- cargo handling equipment
- loading, unloading and care in transit
- piping systems and valves

- tank cleaning, purging, gas-freeing and inerting
- Properties must include:
- chemical symbols
 - pressure and temperature including vapour pressure/temperature relationship
 - types of electrostatic charge generation
- Cargo must include:
- chemicals
 - oil
- Hazards must include:
- corrosion hazards
 - electrostatic hazards
 - environmental hazards
 - explosion and flammability hazards
 - health hazards
 - pressure hazards
 - reactivity hazards
 - sources of ignition
 - toxicity hazards
 - vapour leaks and clouds
- Hazard controls must include:
- anti-static measures
 - atmospheric control
 - cargo inhibition
 - gas testing
 - importance of cargo compatibility
 - inerting, drying and monitoring techniques
 - segregation
 - ventilation
- Firefighting equipment must include:
- firefighting agents
 - fixed dry chemical systems
 - fixed foam systems
 - portable foam systems
- Measures must include:
- assisting in implementing shipboard spill containment procedures
 - reporting relevant information to the responsible person

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA3002A Contribute to safe cargo operations on oil and chemical tankers.

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 MARA002 Contribute to safe cargo operations on oil and chemical tankers

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 on at least one occasion and include:

- communicating clearly and effectively
- correctly identifying safety data sheets (SDS)/material safety data sheets (MSDS), relevant cargo-related hazards to vessel and to personnel, and taking appropriate action
- ensuring cargo operations are carried out according to accepted principles and procedures to ensure safety of operations
- identifying and acting on becoming aware of hazardous situation
- interpreting and applying knowledge of tanker layouts, tanker cargo features, characteristics and hazards, and related hazard prevention strategies to duties on various types of tankers and gas carriers
- reading and interpreting SDS/MSDS
- recognising problems and hazards that can arise when managing safety on a tanker, taking appropriate remedial action and initiating appropriate solutions.

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:

- actions to be taken in the event of spillage
- cargo pumps
- corrosion hazards
- effects of oil and chemical pollution on human and marine life
- features and characteristics of various types of tanker cargo
- functions and processes for the calibration of various types of measuring instruments and devices used to test environments on tankers and gas carriers
- general arrangement and construction of tankers
- hazard controls
- hazard control procedures on tankers and gas carriers
- hazards and control measures associated with tanker cargo operations
- hazards associated with:
 - tanker operations

- carriage of bulk liquids and gases
- hazards to the environment
- information on SDS/MSDS
- Loading and unloading
- measures to be taken in the event of spillage
- physical properties of oil and chemicals
- piping systems and valves
- principles of chemistry as they relate to tanker operations
- procedures for the safe use of personal protective equipment
- procedures to prevent air and water pollution
- reactivity hazards
- shipboard procedures to prevent pollution
- tanker cleaning, purging, gas-freeing and inerting
- tanker safety culture and safety management
- terminology relating to the structure capacities and operations of various types of tankers and gas carriers
- types of oil and chemical tankers
- 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARA003 Manage loading, discharging and stowing of cargo

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage the loading, discharging and stowage of cargo to prevent damage or deterioration and to deliver it, as far as is possible, in as good a condition and order as it was when received aboard.

This unit applies to people working in the maritime industry 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 Plan the stow

- 1.1 Loading manual is interpreted to determine operational loading conditions
- 1.2 Still water shear forces and bending moments in any load or ballast condition are known and not exceeded
- 1.3 Load is planned to ensure stresses in vessel are minimised by evenly distributing cargo
- 1.4 Load is planned to avoid incompatible cargo stowage

- 1.5 Regulations relating to hazardous materials/dangerous goods are observed, where appropriate
- 1.6 Load is planned for unloading sequence
- 1.7 Vessel cargo carrying capacity is not exceeded for appropriate load line
- 1.8 Vessel trim is calculated to allow for optimum vessel performance at sea
- 2 Plan load/unload with stevedores**
 - 2.1 Available port/vessel cargo handling gear and equipment is determined
 - 2.2 Handling capacity of cargo handling gear and equipment is established
 - 2.3 Pumping capacity of cargo pumps is verified
 - 2.4 Availability and status of human resources is resolved
 - 2.5 Cargo manifest is made available
 - 2.6 Cargo stowage plan is completed and agreed with stevedores
 - 2.7 Stability calculation is made and checked against vessel stability information manual
 - 2.8 Notice of readiness to load/unload is provided
- 3 Prepare for loading**
 - 3.1 Holds are checked to ensure they are clean, dry and free of smell
 - 3.2 Safety arrangements in holds are verified to ensure they are operational
 - 3.3 Supplies of dunnage and mats are reviewed to ensure there are sufficient available
 - 3.4 Bilges are covered with tarpaulins/wrappers before loading
 - 3.5 Checks are made to ensure cargo is correctly identified, inspected and confirmed against documentation
 - 3.6 Preparations for loading are monitored according to stowage plan and organisational procedures
- 4 Control loading/unloading of**
 - 4.1 Instructions are given to crew and stevedores involved in cargo loading/unloading according to cargo stowage plan

cargo	4.2	Compliance with regulations, procedures and instructions pertaining to type of cargo being handled is managed during loading/unloading operations
	4.3	Loading/unloading is monitored to ensure loading rate is not exceeded in the case of bulk or liquid cargo
	4.4	Vessel stability is observed during loading/unloading operations
	4.5	Loading/unloading operations are checked against stowage plan
	4.6	Cargo is secured and lashed according to lashing plan
	4.7	All cargo handling documentation is completed according to organisational procedures and regulatory requirements
5 Manage ballast management operations	5.1	Ballast discharge requirements of port authority are complied with
	5.2	Ballast management activities are monitored according to organisational procedures and port authority requirements
	5.3	Ballast management problems are identified and appropriate action is taken to minimise risk to the environment
6 Monitor care of cargo during voyage	6.1	Vessel plan for care of cargo during the voyage is implemented according to organisational and customer requirements, and relevant regulations
	6.2	Ventilation and humidity control systems are checked
	6.3	Action required to maintain the wellbeing of cargo during the voyage is initiated according to customer requirements and organisational procedures
	6.4	Compliance with safety and hazard minimisation procedures and regulations related to cargo care is managed at all times during the voyage to maintain safety of personnel, cargo and vessel
	6.5	Appropriate action is taken in the event of a cargo-related incident or emergency to rectify problem, secure cargo and maintain safety of vessel and personnel

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.

Cargo includes one or more of the following:

- bulk cargo
- containerised cargo
- deck cargo
- liquid cargo
- refrigerated cargo
- any other material, equipment or machinery that may be safely handled and stowed on the vessel

Hazardous materials/dangerous goods include one or more of the following:

- any cargo described in the International Maritime Dangerous Goods (IMDG) Code as hazardous or dangerous

Cargo handling gear and equipment includes one or more of the following:

- cargo pumps
- cranes
- derricks
- grabs
- hooks, wires and shackles
- slings

Cargo stowage plan must include:

- cargo weight
- correct description and stowage of hazardous and dangerous

	- goods - description of cargo to be loaded - load/discharge port - segregation of non compatible cargo
Ballast management problems include one or more of the following:	- confirmation that the stowage plan conforms to stability requirements at all stages of loading and discharging - contaminated ballast - failure of ballast pumps
Cargo-related incidents or emergencies include one or more of the following:	- cargo handling gear failure - cargo shift - leakage - spontaneous combustion

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA4001A Manage loading, discharging and stowing of cargo.

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 MARA003 Manage loading, discharging and stowing of cargo

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 on at least one occasion and include:

- developing effective planning document
- identifying and solving problems related to loading, stowage, security and unloading of cargo
- interpreting stability manual and ensuring stability calculations are within appropriate parameters for proposed cargo operation
- monitoring use of equipment involved in loading, stowage, security and unloading of cargo
- producing reliable documentation
- reading, interpreting and applying instructions, regulations, procedures and information relevant to loading, stowage, security and unloading of cargo.

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:

- ballast management issues and procedures
- cargo handling documentation requirements
- container position numbering
- design of vessel hold
- effects on cargo handling of sea conditions, wind and weather
- effects of different types of cargo operations on vessel trim and stability
- effects upon stability during loading and discharging operations including heeling moments from gear and loads
- homogenous loading
- main stresses set up by cargo, hogging, sagging and shearing
- methods of;
 - handling various types of cargo
 - caring for various types of cargo

- operational characteristics of different types of shipboard and terminal-based cargo handling equipment and facilities
- principles of cargo care
- procedures for carrying out calculations involving weights, capacities, stowage factors, load densities
- relevant sections of applicable maritime regulations
- relevant work health and safety (WHS)/occupational health and safety (OHS) and cargo handling legislation, codes of practice, policies and procedures
- standard stowage position numbering systems used on container vessels
- static and dynamic loads
- survey and inspection requirements for cargo handling equipment
- types of lashing devices
- typical cargo handling problems and hazards, and appropriate preventative and remedial actions and solutions
- typical types and sizes of shipping containers
- usual methods of packing, loading and discharging, stowage, dunnaging etc.
- use of cargo handling gear including purchases and tackles
- various types of cargo likely to be carried; their peculiar characteristics, liability to damage, decay or deterioration; their measurements; their hazards and problems, and appropriate preventative and remedial action and solutions
- ways of restricting vessel stress levels within permitted levels within permitted limits during loading/discharging cargo.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARAO04 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 include:

- correlation against stability book data
- 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

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 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARAO05 Maintain vessel stability

Modification History

Release 2. Application, Elements and Performance Criteria and other minor edits were corrected to include relevant information.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to determine the stability and trim of a vessel to ensure that stability conditions of vessel comply with intact stability criteria under all conditions of loading.

This unit applies to the work of a Watchkeeper Deck, Master up to 500 gross tonnage and Master up to 80 metres Near Coastal.

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

1 Calculate stability	1.1	Vessel stability data book is accessed and checked for endorsement
	1.2	Data is interpreted to determine vessel safety parameters
	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	Spurious or incorrect information is recognised and recalculated
	1.6	Trim, draughts and list are adjusted as required
	1.7	Stability calculations are conducted at a time, frequency and scope appropriate to voyage
2	Manage weight distribution	
	2.1	Stability calculations are used to plan weight distribution to ensure assigned load line conditions are not exceeded
	2.2	Weight distribution is controlled to maintain vessel within acceptable stability and stress limits for loading operation and at all stages of voyage
	2.3	Appropriate action is taken when weight distribution is compromising vessel safety
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 include:

- calculation of areas under the curve
- changes in draft and trim due to differing water densities
- correction for free surface effect
- draft and trim
- metacentric height
- moment of statical stability at small angles of heel
- transverse and longitudinal stability
- values for righting levers and construction of the curve of stability

Appropriate action includes one or more of the following:

- amending the vessel loading plan
- ballast management
- reduction of free surface

Data and information related to stability management includes one or more of the following:

- cargo stowage and loading plan
- records of stability calculations
- safety management system
- stability and trim booklet

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA5001A Maintain 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 MARA005 Maintain vessel stability

Modification History

Release 2. Application, Elements and Performance Criteria and other minor edits were corrected to include relevant information.

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 on at least one occasion and include:

- applying knowledge of stability, trim and stress tables, diagrams and stress calculating equipment
- carrying out calculations required when determining vessel stability and trim
- managing the loading and weight distribution of a vessel to ensure assigned load line conditions are not exceeded
- managing vessel stability in a range of conditions
- reading and interpreting vessel specifications and design drawings
- recognising problems affecting vessel stability and trim.

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:

- calculation of vessels stability using the inclining experiment
- effects of angle of loll
- effects of beam and form coefficient on the stability of a vessel
- effects of density of sea water on the draught and freeboard of a vessel
- effects of free surface on the stability of a vessel
- features of the load-line and draught marks of a vessel and methods for performing related calculations
- fundamental actions to be taken in the event of partial loss of intact buoyancy
- fundamentals of watertight integrity
- principal stresses that act on the structure of a vessel
- principal structural members of a vessel and the proper names for various parts
- problems related to the control of trim, stability and stresses of vessels and appropriate action and solutions

- sections of the International Maritime Organization (IMO), Standards of Training, Certification & Watchkeeping (STCW) and Australian Maritime Safety Authority (AMSA) Marine Orders related to intact stability criteria
- stability, trim and stress tables, diagrams and stress calculating equipment
- theory and calculations of vessel stability and dynamics
- use of computer programs in calculating stability
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARAO06 Monitor loading, unloading and stowage of cargo

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to monitor the loading, stowage, securing and care of cargo during the voyage and the unloading of cargo according to the cargo plan, organisational procedures and vessel stowage limitations.

This unit applies to the work of a Watchkeeper Deck, Master up to 500 gross tonnage and Master up to 80 metres Near Coastal.

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 Review cargo plan

1.1	Cargo plan is interpreted to determine required cargo operations
1.2	Cargo plan is checked to ensure cargo is evenly distributed
1.3	Cargo plan is assessed to ensure incompatible cargo stowage is avoided

- 1.4 Cargo plan is evaluated to ensure regulations relating to hazardous materials/dangerous goods are observed, where appropriate
- 1.5 Cargo plan is checked to ensure unloading sequence is effective
- 2 Prepare for loading**
 - 2.1 Holds are checked to ensure they are clean, dry and free of smell
 - 2.2 Safety arrangements in holds are verified to ensure they are operational
 - 2.3 Supplies of cargo protection and securing material are reviewed to ensure there are sufficient available
 - 2.4 Bilge suctions are protected before loading
 - 2.5 Checks are made to ensure cargo is correctly identified, inspected and confirmed against documentation
 - 2.6 Preparations for loading are monitored according to stowage plan and organisational procedures
 - 2.7 Ballast discharge plan is identified and understood and appropriate actions to support this plan are undertaken
- 3 Supervise loading/unloading of cargo**
 - 3.1 Instructions are given to crew and stevedores involved in cargo loading/unloading according to cargo stowage plan
 - 3.2 Compliance with regulations, procedures and instructions pertaining to type of cargo being handled is managed during loading/unloading operations
 - 3.3 Loading/unloading is monitored to ensure the loading rate is not exceeded in the case of bulk or liquid cargo
 - 3.4 Vessel stability is observed during loading/unloading operations
 - 3.5 Loading/unloading operations are checked against stowage plan
 - 3.6 Cargo is secured and lashed according to lashing plan
 - 3.7 Cargo handling documentation is completed according to organisational procedures and regulatory requirements
- 4 Monitor care of**
 - 4.1 Vessel plan for care of cargo during voyage is implemented according to organisational and customer requirements, and

cargo during voyage

relevant regulations

- 4.2 Ventilation and humidity control systems are checked
- 4.3 Actions required to maintain the wellbeing of cargo during the voyage are initiated according to customer requirements and organisational procedures
- 4.4 Compliance with safety and hazard minimisation procedures and regulations related to cargo care is managed at all times during the voyage to maintain the safety of personnel, cargo and vessel
- 4.5 Appropriate action is taken when defects or damage to cargo are detected

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.

- Cargo plan must include:
- cargo weight
 - correct description and stowage of hazardous and dangerous goods
 - description of cargo to be loaded
 - load/discharge port
 - segregation of non compatible cargo
 - stowage of refrigerated containers

Incompatible cargo stowage includes one or more of the following:	• cargo liable to taint • dangerous and hazardous goods
Hazardous materials/dangerous goods includes one or more of the following:	• any cargo described in the International Maritime Dangerous Goods (IMDG) Code as hazardous or dangerous
Cargo includes one or more of the following:	• bulk cargo • containerised cargo • deck cargo • heavy lift cargo • liquid cargo • refrigerated cargo • any other material, equipment or machinery that may be safely handled and stowed on vessel
Cargo handling documentation includes one or more of the following:	• cargo gear register • cargo receipts • Cargo Securing Manual • logbook entries • Note of Protest • Notice of Readiness to load or discharge • operation orders and instructions • safety data sheets (SDS)/material safety data sheets (MSDS) • safety management system relating to cargo carriage • ship/shore safety checklists
Actions required to maintain the wellbeing of cargo include one or more of the following:	• maintaining adequate ventilation • monitoring cargo spaces • temperature control of refrigerated or cooled cargo
Defects or damage to cargo include one or more of the following:	• damage caused by cargo movement • deterioration of perishable cargo • water ingress

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA5002A Monitor loading, unloading and stowage of cargo.

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 MARA006 Monitor loading, unloading and stowage of cargo

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 on at least one occasion and include:

- carrying out cargo operations according to cargo plan or other documents and established safety rule/regulations, equipment operating instructions and shipboard stowage limitations
- establishing and maintaining effective communications during loading and unloading
- handling dangerous, hazardous and harmful cargo to comply with international regulations, recognised standards and codes of safe practice
- identifying and solving problems associated with loading, unloading, stowage and care of cargo
- initiating timely action in response to defects or damage
- monitoring and anticipating problems and risks associated with loading, unloading, stowage and care of cargo
- monitoring use of equipment in loading, unloading, stowage and care of cargo
- reading, interpreting and applying instructions, regulations, procedures and information associated with loading, unloading, stowage and care of cargo.

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:

- ballast management issues and procedures
- cargo handling documentation requirements
- cargo lifting equipment and safe working loads
- container position numbering
- effect of cargo, including heavy lifts, on the seaworthiness and stability of the vessel
- effects of different types of cargo operations on vessel trim and stability
- effects on cargo handling of sea conditions, wind and weather
- effects on stability during loading and discharging operations including heeling moments from gear and loads
- methods of caring for various types of cargo
- methods of handling various types of cargo

- operational characteristics of different types of shipboard and terminal-based cargo handling equipment and facilities
- principles of cargo care
- procedures for carrying out calculations involving weights, capacities, stowage factors
- relevant sections of applicable maritime regulations
- relevant work health and safety (WHS)/occupational health and safety (OHS) and cargo handling legislation, codes of practice, policies and procedures
- safe handling, stowage and securing of cargo including dangerous, hazardous and harmful cargo, and their effect on the safety of life and the vessel
- standard stowage position numbering systems used on container vessels
- typical cargo handling problems and hazards, and appropriate preventative and remedial actions and solutions
- typical types and sizes of shipping containers
- usual methods of container packing, loading and discharging, stowage, dunnaging
- various types of cargo likely to be carried; their peculiar characteristics, liability to damage, decay or deterioration; their measurements, hazards and problems; appropriate preventative and remedial action and solutions
- ways of restricting vessel stress levels within permitted levels within permitted limits during loading/discharging cargo.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB001 Assist with routine maintenance of a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to carry out general routine maintenance on a vessel up to 80 metres.

This unit applies to general purpose hands working in the maritime industry on vessels up to 80 metres in near coastal waters as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

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 Select and set up equipment and materials for cleaning

- 1.1 Equipment is selected according to type of cleaning to be undertaken
- 1.2 Equipment is checked to ensure it is clean and serviceable
- 1.3 Suitable dry and wet cleaning agents and chemicals are selected and prepared according to manufacturer instructions and work health and safety(WHS)/occupational health and safety (OHS) requirements

- 1.4 Suitable personal protective clothing and equipment is selected and used where necessary
- 2 Clean work area**
 - 2.1 Work area to be cleaned is prepared and hazards are identified
 - 2.2 Work area is barricaded or warning signs are provided, as appropriate, to reduce risk to self and other crew members
 - 2.3 Correct cleaning agents are selected and applied according to manufacturer instructions and WHS/OHS requirements
 - 2.4 Equipment is used correctly and safely
- 3 Follow instructions to carry out routine maintenance of vessel machinery**
 - 3.1 Suitable personal protective clothing is selected and used according to WHS/OHS safety requirements
 - 3.2 Greasing, lubrication and other routine servicing of vessel machinery and equipment is carried out according to supervisor and manufacturer instructions
 - 3.3 Routine adjustments and repairs are made to vessel machinery and equipment according to supervisor and manufacturer instructions
 - 3.4 Faulty vessel machinery and equipment is identified and reported according to workplace procedures
- 4 Prepare and paint surfaces**
 - 4.1 Suitable personal protective clothing is selected and used according to WHS/OHS requirements
 - 4.2 Surfaces are prepared using correct equipment
 - 4.3 Rust remover, rust converter and undercoats are applied according to manufacturer specifications
 - 4.4 Paints are mixed in correct proportions according to manufacturer specifications
 - 4.5 Finishing coat is applied using brush, roller or spray gun
- 5 Maintain and store tools, equipment and chemicals**
 - 5.1 Equipment and tools are cleaned, returned to operating order and stored according to supervisor and manufacturer instructions
 - 5.2 Environmental procedures are followed and waste from cleaning and maintenance tasks is collected, treated and disposed of or recycled, according to workplace procedures

- 5.3 Work area is cleaned and maintained according to workplace requirements
- 5.4 Malfunctions, faults, wear or damage to tools are reported according to workplace procedures
- 5.5 Chemicals are stored according to supervisor and manufacturer instructions

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.

Equipment includes one or more of the following:

- cleaning supplies
- hand held power tools
- hand tools
- grease guns
- paint and rust prevention material
- personal protective equipment

Personal protective clothing and equipment includes one or more of the following:

- boots
- gloves
- hat/hard hat
- hearing protection
- overalls
- protective eyewear

- respirator or face mask
- safety harness
- sun protection
- wet weather gear

Work area includes one or more of the following:

- battery room
- engine room
- exposed deck area
- firefighting equipment spaces
- store room
- wheelhouse and accommodation area

Routine adjustments and repairs includes one or more of the following:

- checking cooling system, fuel, grease and oil, battery levels
- dismantling and assembling
- inspecting fan belts, leads, lines, connections, air filters, hydraulics, lighting
- making minor adjustments
- testing

Surfaces include one or more of the following:

- external and internal bulkhead
- funnel
- hatches and coamings
- hull
- masts

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB1001A Assist with routine maintenance of a 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 MARB001 Assist with routine maintenance of a 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 on at least one occasion and include:

- completing maintenance records
- implementing safe and environmentally responsible work practices
- reading, interpreting and applying manufacturer instructions including all WHS/OHS requirements and data safety sheets (SDS)/material safety data sheets (MSDS)
- recognising faulty equipment
- selecting and using correct tools and equipment for cleaning or maintenance task.

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:

- component parts, operation and routine maintenance requirements of vessel machinery
- environmental and waste management procedures:
 - preventative measures with regard to damage to natural areas caused by servicing, maintenance and cleaning activities
 - safely using and disposing of cleaning and maintenance debris including oil containers, fuel and chemical residues, paint
- equipment cleaning and preservation techniques
- maintenance hazards and problems
- paint types and applications
- principles and procedures of machinery lubrication as they relate to vessel machinery
- procedures for using hand tools for routine maintenance operations
- relevant WHS/OHS and pollution control legislation
- rust treatment
- techniques for maintenance of surfaces including paint, timber, fibre glass, steel and aluminium
- types, characteristics and functions of:
 - equipment/tools used in cleaning and maintenance
 - vessel machinery and equipment
- workplace cleaning and maintenance procedures.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB002 Perform basic servicing and maintenance of main propulsion unit and auxiliary systems

Modification History

Release 1.0 New unit of competency.

Application

This unit involves the skills and knowledge required to perform basic maintenance and servicing of main propulsion units and auxiliary systems.

This unit applies to deck workers in the maritime industry on vessels up to 12 metres in near coastal waters.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

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 Prepare for work

- 1.1 Manufacturer equipment specifications are obtained
- 1.2 Safety requirements associated with maintaining equipment and workplace environment are implemented
- 1.3 Tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work

	1.4	Tools and equipment are selected and checked for serviceability
	1.5	Work area is prepared
2 Carry out routine service	2.1	Equipment is inspected and inspection results are compared with manufacturer specifications
	2.2	Servicing tasks are carried out to specification
	2.3	Mechanical equipment and system components are checked with appropriate instruments
	2.4	Faulty items or components are identified and serviceability/ unserviceability is determined
	2.5	Unserviceable equipment is tagged according to workplace procedures
3 Repair/replace faulty components	3.1	Equipment is safely isolated according to regulations and/or work health and safety (WHS)/occupational health and safety (OHS) requirements
	3.2	Faulty items or components are removed using appropriate tools and equipment according to workplace procedures
	3.3	Replaceable items are selected or serviceable items are fitted according to manufacturer specifications
	3.4	Adjustments are made to equipment or components to comply with specifications
	3.5	Operational check is carried out on system to ensure its compliance with manufacturer specification
	3.6	Maintenance report is completed according to workplace procedures
4 Clean up	4.1	Work area is cleared and cleaned
	4.2	Materials are disposed of or recycled according to legislative and workplace requirements
	4.3	Tools and equipment are cleaned, checked and stored according to workplace 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.

- Equipment must include:
- auxiliary equipment
 - bilge systems
 - cooling, lubricating and fuel systems
 - drive train assembly
 - fire pumping arrangements
 - low voltage electrical systems
 - monitoring machinery
 - petrol, diesel and outboard engines
 - shore power leads and connections
 - steering gear
 - two and four stroke engines

- Safety requirements include one or more of the following :
- personal protective equipment (PPE) including that prescribed under legislation, regulation and organisational policies and procedures
 - safe operating procedures including recognising and preventing hazards associated with the use of tools and equipment, dangerous materials, working at heights, working at proximity to others, worksite visitors and the public
 - state/ territory WHS/OHS requirements (specifically relating to PPE, use of tools and equipment, workplace environment and safety, handling of materials, hazard control, hazardous materials and substances)
 - emergency procedures including emergency shutdown and stopping of equipment, extinguishing fires, organisational first

aid requirements, evacuation

Tools and equipment include one or more of the following:

- hand and power tools
- ladders
- test equipment

Servicing tasks include one or more of the following:

- battery maintenance
- carrying out manufacturer instructions for pre-start checks
- checking
 - shaft glands
 - strainers
 - cooling system
 - fuel levels
 - fuel systems
- greasing
- oiling
- visually checking for oil leaks
- visually checking, identifying and reporting obvious equipment faults

Faulty items or components include one or more of the following:

- batteries and connections
- engine parts
- fuel pump

Materials include one or more of the following:

- rags
- spent oil

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB2001A Perform basic servicing and maintenance of main propulsion unit and auxiliary systems.

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 MARB002 Perform basic servicing and maintenance of main propulsion unit and auxiliary systems

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 on at least one occasion and include:

- completing all work to specification
- completing relevant logbooks and service reports
- implementing safe and environmentally responsible work practices in servicing and maintenance activities
- providing the required amount of detail in reports
- reading and interpreting gauges
- reading and interpreting manufacturer specifications and safety data sheets (SDS)/material safety data sheets (MSDS)
- selecting and using appropriate processes, tools and equipment
- servicing and maintaining propulsion machinery and auxiliary equipment to manufacturer specifications.

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:

- bleeding fuel systems
- care of low voltage electrical systems on a vessel including precautions necessary when charging batteries
- environmental impacts and minimisation measures associated with servicing and maintaining propulsion machinery and auxiliary equipment
- job safety analyses (JSAs) and safe work method statements
- manufacturer specifications for servicing and maintaining propulsion machinery and auxiliary equipment
- operating principles and operating methods for propulsion machinery and auxiliary equipment
- potential risks and hazards associated with servicing and maintaining propulsion machinery and auxiliary equipment
- processes of maintaining propulsion machinery and auxiliary equipment
- relevant WHS/OHS and personal protective equipment (PPE) requirements

- routine checks required when servicing and maintaining propelling machinery, auxiliary equipment and other mechanical equipment.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB003 Service marine internal combustion engines, and propulsion and auxiliary systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform basic servicing of marine internal combustion engines, and propulsion and auxiliary systems.

This unit applies to engine workers in the maritime industry on vessels with a propulsion power up to 750 kW in near coastal waters.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

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 Prepare for work

- 1.1 Planned maintenance program is accessed to determine servicing requirements
- 1.2 Inspections are conducted and additional non-routine servicing requirements are determined
- 1.3 Manufacturer specifications for equipment are obtained

	1.4	Tasks are planned and sequenced in conjunction with others involved in or affected by servicing work
	1.5	Equipment is safely isolated according to regulations and work health and safety (WHS)/occupational health and safety (OHS) requirements
	1.6	Tools and equipment are selected and checked for serviceability
	1.7	Work area is prepared
2	Carry out routine service	
	2.1	Equipment is inspected throughout servicing and inspection results are compared with manufacturer specifications
	2.2	Servicing tasks are carried out to specification
	2.3	Mechanical equipment and system components are checked with appropriate instruments
	2.4	Unserviceable equipment is tagged according to workplace procedures and appropriate personnel are notified
3	Repair and replace faulty components	
	3.1	Faulty items or components are removed using appropriate tools and equipment according to workplace procedures
	3.2	Replaceable items are selected or serviceable items are fitted according to manufacturer specifications
	3.3	Adjustments are made to equipment or components to ensure compliance with specifications
	3.4	Operational check is carried out on system to ensure compliance with manufacturer specifications
4	Clean up and complete documentation	
	4.1	Work area is cleared and cleaned
	4.2	Materials are disposed of or recycled according to legislative and workplace requirements
	4.3	Tools and equipment are cleaned, checked and stored according to workplace procedures
	4.4	Maintenance report is completed according to workplace 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.

- Equipment includes one or more of the following:
- auxiliary equipment and associated spaces
 - cooling systems
 - firefighting equipment
 - fuel systems
 - gearbox
 - lubricating systems
 - marine two- and four-stroke:
 - diesel engines
 - petrol engines
 - propeller and immediate shafting alignment
 - pumping systems
 - refrigeration systems
 - sterndrive and water jet drive units
 - steering systems

- Tools and equipment include one or more of the following:
- hand and power tools
 - specialised tools
 - test equipment

- Servicing tasks include one or more of the following:
- cleaning:
 - coolers
 - filters

- greasing
- oiling
- replacing:
 - anodes
 - shaft seals and gland packing
 - belt drives
 - pumps
- topping up oils

Materials include one or more of the following:

- cleaning products
- rags
- refrigerant gas
- spent oil
- used components

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB2002A Service marine internal combustion engines and propulsion and auxiliary systems.

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 MARB003 Service marine internal combustion engines, and propulsion and auxiliary systems

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 on at least one occasion and include:

- implementing safe and environmentally responsible work practices
- implementing workplace environmental and waste management procedures correctly
- reading and interpreting:
 - manufacturer specifications
 - safety data sheets (SDS)/material safety data sheets (MSDS).

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:

- basic combustion process
- basic electronic control unit and governor maintenance
- basic reverse/reduction gearbox maintenance
- basic timing diagrams
- circulating pumps and maintenance
- controllable pitch propellers maintenance
- cooling systems and cooling system maintenance
- couplings types, fittings, keys and keyways, securing nuts, locking
- environmental responsibilities, regulations and legislative requirements
- fuel systems and fuel system maintenance
- intake system and system maintenance
- instrumentation maintenance
- intermediate bearing maintenance
- lube oil:
 - system and system maintenance
 - contamination
- lubricating systems and systems maintenance
- maintenance of:
 - drive systems, belts, clutches, motors

- hydraulic systems
- pumping systems
- refrigeration systems
- sea water piping including corrosion control
- shaft seals and rudder stock, glands and packings
- steering systems
- marine two- and four- stroke:
 - diesel engines
 - petrol engines
- own ability and limits to rectify irregularities and faults
- principles and procedures of lubrication
- propeller and intermediate shafting alignment
- routine servicing of:
 - firefighting equipment in engine space
 - valves
- sterndrive and water jet drive units maintenance
- types, characteristics and functions of equipment/tools used in maintenance
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB004 Perform routine maintenance on a vessel up to 24 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform routine remedial, preventative and survey deck maintenance. It includes basic deck maintenance, cleaning tasks, marine painting, and servicing deck machinery and systems on commercial vessels up to 24 metres.

This unit applies to people working in the capacity of Master on a range of vessels up to 24 metres in near coastal waters.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

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 maintenance tasks

1.1	Planned maintenance system is accessed to establish maintenance requirements for vessel
1.2	Maintenance tasks are proposed and prioritised in conjunction with others involved in or affected by the maintenance work

	1.3	Resource requirements are identified and allocated to ensure efficient completion of tasks
	1.4	Maintenance tasks to be performed are recorded in a maintenance schedule according to organisational procedures
2 Perform basic deck maintenance	2.1	Deck surfaces are checked according to planned maintenance system
	2.2	Any deterioration or corrosion of vessel deck surfaces is identified and appropriate maintenance action is carried out according to planned maintenance system
	2.3	Minor faults and imperfections in paint surfaces are repaired according to organisational procedures
	2.4	Weathered surfaces are restored using cleaners and liquid abrasives according to manufacturer instructions and organisational procedures
	2.5	Tools and equipment are used correctly and safely
	2.6	Maintenance materials are obtained, prepared and applied according to organisational procedures and manufacturer instructions
3 Carry out cleaning activities	3.1	Area to be cleaned is prepared and hazards are identified
	3.2	Work area is barricaded or warning signs provided, as appropriate, to reduce risk to other crew members
	3.3	Correct chemicals and cleaning agents are selected and applied according to manufacturer instructions and work health and safety (WHS)/occupational health and safety (OHS) requirements
	3.4	Equipment is used correctly and safely
	3.5	Cleaning tasks are completed according to organisational procedures and manufacturer instructions
4 Prepare and paint surfaces	4.1	Suitable personal protective clothing is selected and used according to WHS/OHS requirements
	4.2	Surfaces are prepared using correct equipment
	4.3	Rust remover, rust converter and undercoats are applied according to manufacturer specifications

	4.4	Paints are mixed in correct proportions according to manufacturer specifications
	4.5	Paint is applied using appropriate application equipment
5 Carry out routine maintenance of deck fittings, equipment and systems	5.1	Fittings and equipment are inspected and inspection results are compared with manufacturer specifications
	5.2	Maintenance tasks are carried out to specification
	5.3	Mechanical equipment and system components are checked with appropriate instruments
	5.4	Faulty items or components are identified and maintenance procedures selected
	5.5	Unserviceable equipment is tagged and faults are identified according to organisational procedures
6 Repair/replace faulty fittings and equipment	6.1	Fittings and equipment are safely isolated according to regulations and WHS/OHS requirements
	6.2	Faulty fittings or equipment are removed using appropriate tools, equipment and procedures
	6.3	Replaceable items are selected or serviceable items are fitted according to manufacturer specifications
	6.4	Adjustments are made to fittings or equipment to comply with specifications
	6.5	Operational check is carried out to ensure compliance with manufacturer specifications
	6.6	Maintenance report is completed according to organisational procedures
7 Supervise crew in completing maintenance tasks	7.1	Workload is organised in order of priority according to planned maintenance system
	7.2	Maintenance tasks are allocated to appropriate crew members with consideration of individual experience and qualifications
	7.3	Crew members are clearly briefed on their responsibility and maintenance tasks and WHS/OHS requirements
	7.4	Guidance is provided appropriate to maintenance task and individual experience

- 7.5 Completed work is checked to ensure maintenance is performed according to organisational procedures
- 8 Clean up**
- 8.1 Work area is cleared and cleaned for serviceable condition
- 8.2 Materials are disposed of or recycled according to legislative and organisational requirements
- 8.3 Tools and equipment are cleaned, checked 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.

Maintenance tasks include one or more of the following:

- fire and bilge pumps
- lifesaving appliances
- greasing and oiling
- ropes and wires
- rust prevention

Area includes one or more of the following:

- battery room
- engine room
- exposed deck area
- firefighting equipment spaces
- store room
- wheelhouse and accommodation area

Fittings and equipment include one or more of the following:

- fuel, fresh and ballast water, bilge and firefighting pumps
- lifting equipment
- navigation lights and shapes
- sounding and ventilation arrangements
- steering gear
- windlass and capstan

Materials include one or more of the following:

- cleaning chemicals
- paint residues
- rags
- spent oil

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB3002A Perform routine maintenance on a vessel up to 24 metres.

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 MARB004 Perform routine maintenance on a vessel up to 24 metres

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 on at least one occasion and include:

- completing required records when performing routine remedial, preventative and survey deck maintenance on a vessel
- demonstrating safe and environmentally responsible work practices when performing routine remedial, preventative and survey deck maintenance on a vessel
- following required work schedule according to organisational requirements
- identifying samples of construction material
- identifying structural components from ship's drawings and plans, locating on a vessel and ascertaining the relevant regulation governing the structure
- reading and interpreting:
 - instructions for performing routine remedial, preventative and survey deck maintenance on a vessel
 - manufacturer specifications and safety data sheets (SDS)/material safety data sheets (MSDS)
- recognising routine problems when performing routine remedial, preventative and survey deck maintenance on a vessel
- selecting and using relevant tools, equipment and materials according to instructions.

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:

- component parts, operation and routine maintenance requirements of vessel machinery
- equipment cleaning and preservation techniques
- function of structural components and compliance with conventional maritime design
- job safety analyses (JSAs)/safe work method statements
- maintenance hazards and problems
- maintenance of steering gear
- maintenance records for a vessel
- nature and causes of corrosion of marine surfaces, structures and available methods of control

- principal parts of a vessel and basic design methods
- organisational procedures for cleaning and maintenance to ensure operational readiness
- paint types and applications
- principles and procedures of machinery lubrication as they relate to vessel machinery
- procedures for checking deck areas, machinery and fittings of a vessel as part of the planned routine maintenance on a vessel
- procedures for using hand tools for routine maintenance operations
- relevant WHS/OHS and:
 - personal protective equipment requirements
 - pollution control legislation
- rust treatment
- safety management system as it relates to planned vessel maintenance
- steering gear arrangements and safety features
- storage principles for paints, chemicals and cleaning agents used in planned maintenance operations
- types, characteristics and functions of:
 - vessel machinery and equipment including safety features
 - equipment/tools used in cleaning and maintenance
- use of various construction material and regulations governing structure.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB005 Slip or dock a vessel and maintain hull on a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to slip or dock a vessel of up to 80 metres and carry out all required maintenance procedures to manage hull deterioration and to maintain the watertight integrity of the vessel.

This unit applies to people working in the maritime industry on a range of vessels up to 80 metres in near coastal waters.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

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 Safely dock vessel into dry dock or slipway

- 1.1 Slipway or dry dock particulars are assessed for suitability for dry docking or slipping vessel
- 1.2 Ship supports, scaffolding and other service systems are assessed for compatibility to dry dock or slipway particulars
- 1.3 Plan is prepared for docking or slipping vessel

	1.4	Cradle, supports and/or slings are prepared prior to slipping vessel
	1.5	Vessel is made ready for slipping according to organisational and dry dock requirements
	1.6	Vessel is slipped according to environmental safe work practices and safety instructions
2 Inspect underwater hull, equipment and fittings	2.1	Checks of vessel hull, equipment and fittings are carried out according to maintenance schedules and vessel manufacturer instructions
	2.2	Deterioration in vessel structure, equipment and fittings is identified
	2.3	Checks on watertight integrity of vessel are carried out according to organisational procedures and safety regulations
	2.4	Damage to watertight integrity is identified and appropriate action is determined
	2.5	Listed work plan is prepared to rectify all identified faults
	2.6	Surveyor or authorised person is engaged to ensure appropriate certification can be issued or endorsed on completion of work, where applicable
3 Select and use maintenance equipment and materials	3.1	Tools and equipment are correctly identified, selected and used
	3.2	Maintenance materials are obtained, prepared and used according to organisational procedures and manufacturer instructions
	3.3	Environmental procedures are followed and waste from cleaning and maintenance tasks is collected, treated and disposed of, or recycled, according to organisational procedures
	3.4	Malfunctions, faults, wear or damage to tools are reported according to organisational procedures
	3.5	Equipment and tools are cleaned, returned to operating order and stored according to organisational procedures and manufacturer instructions
	3.6	Chemicals are used and stored according to organisational procedures and manufacturer instructions

	3.7	Paint is used and stored according to organisational procedures and manufacturer instructions
4 Carry out required maintenance and repairs to hull, equipment and fittings	4.1	Suitable personal protective clothing is selected and used according to work health and safety (WHS)/occupational health and safety (OHS) requirements
	4.2	Permits for hot work, confined space entry and other high risk activities are completed according to organisational and regulatory requirements
	4.3	Faults and imperfections in painted surfaces are repaired according to organisational procedures
	4.4	Weathered surfaces are restored using cleaners and liquid abrasives
	4.5	Lubricants are applied to moving parts of vessel underwater equipment according to manufacturer instructions
	4.6	Corrosion control is carried out according to organisational procedures and manufacturer instructions
	4.7	Action to ensure watertight integrity is completed
	4.8	Routine adjustments are made to equipment and fittings according to manufacturer instructions
	4.9	Faulty vessel machinery and fittings are identified and replacement procedures are implemented
5 Supervise crew completing maintenance and repairs to hull, equipment and fittings	5.1	Workload is organised in order of priority, taking into consideration all listed work including survey work
	5.2	Maintenance tasks are allocated to appropriate crew members with consideration of individual experience and qualifications
	5.3	Crew members are clearly briefed on their responsibility, maintenance tasks and WHS/OHS requirements
	5.4	Guidance is provided appropriate to the maintenance task and individual experience
	5.5	Completed work is checked to ensure maintenance is performed according to dry dock plan and organisational procedures
6 Complete duties	6.1	Final internal inspection of vessel is conducted to ensure all

prior to refloating

listed work is completed to a satisfactory standard

- 6.2 External inspection of hull and underside is carried out to ensure all listed work is completed to a satisfactory standard
- 6.3 All tank plugs that have been drawn are replaced
- 6.4 Crew are instructed on activities to be completed to make vessel ready for sailing
- 6.5 Check is conducted to ensure a full set of tank soundings has been taken and the distribution of fresh water, fuel and lubricating oil are according to soundings taken on arrival
- 6.6 Tank quantities are applied to complete stability check to ensure that the vessel has an acceptable GM once she floats clear of the keel blocks or slipway
- 6.7 All hatch covers are closed and watertight integrity of uppermost deck is assured
- 6.8 Anchors and cables are heaved up and stowed correctly, and all shore pipelines and powerlines are disconnected
- 6.9 Confirmation that refloating can proceed is agreed with person in charge of refloating operation

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.

Slipway or dry dock particulars include one or more of the following:

- acceptable draught
- crane lifting capacities
- dimensions
- electric power supply
- firefighting provisions
- insurances
- policy and facility for atmospheric checks of confined spaces
- responsibility for WHS/OHS
- safe vessel access
- safe working load
- travel lifts and appropriate lifting equipment
- type of floor

Environmental procedures must include:

- application of paint
- disposal of waste from hull scraping operations
- disposal of waste material
- fuel transfer operations

Routine adjustments include one or more of the following:

- ranging and examination of anchors and cables
- withdrawing and examination of:
 - propeller and shafts
 - rudder and rudder stock

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB3005A Slip or dock a vessel and maintain hull on a vessel up to 80 metres.

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 MARB005 Slip or dock a vessel and maintain hull on a vessel up to 80 metres

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 on at least one occasion and include:

- completing maintenance records
- developing effective planning documents
- implementing safe and environmentally responsible work practices
- liaising with surveyor to ensure work is carried out to regulatory requirements for the issue or endorsement of relevant certificates
- reading, interpreting and applying:
 - operating and service manuals for the slipping/docking of a vessel and the maintenance of its hull
 - manufacturer instructions including all WHS/OHS requirements and safety data sheets (SDS)/material safety data sheets (MSDS)
- recognising faulty equipment
- recognising hull damage and deterioration, and taking appropriate actioning according to organisational procedures
- selecting and using correct tools and equipment for maintenance task.

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:

- basic stability and stability terms
- component parts, operation and routine maintenance requirements of vessel equipment and fittings
- equipment cleaning and preservation techniques
- maintenance hazards and problems
- nature and causes of corrosion of marine surfaces and structures, and the available methods for its control
- organisational procedures for cleaning and maintenance
- paint types and applications
- preservatives and finishes used in marine maintenance and the related procedures for their handling, preparation, application and storage

- principal features of structure of vessels
- principles and procedures of lubrication as they relate to underwater vessel equipment and fittings
- procedures for:
 - working in confined spaces
 - initiating and coordinating repair and/or replacement of underwater equipment and fittings
 - checking and inspecting vessel hull as part of routine maintenance procedures
- regulatory certification requirements
- relevant sections of state and territory regulations, National Standard for Commercial Vessels (NSCV) Code and Uniform Shipping Laws (USL) Code dealing with Master responsibilities
- relevant WHS/OHS and pollution control legislation
- rust treatment
- slipping and docking procedures suitable for various types of hull forms
- stability as it relates to docking or slipping operation and refloating
- types, characteristics and functions of:
 - underwater vessel machinery and equipment
 - equipment/tools used in cleaning and maintenance.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARB006 Maintain marine internal combustion engines, propulsion plant and auxiliary systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to complete basic maintenance of marine internal combustion engines, propulsion plant and auxiliary systems.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

Unit Sector

Not applicable.

Elements and Performance Criteria

1 Plan maintenance activities	1.1	Maintenance plan is accessed to determine maintenance requirements for engines, propulsion plant and auxiliary systems
	1.2	Inspections are conducted and additional non-routine maintenance requirements are determined
	1.3	Manufacturer specifications for machinery and equipment are obtained
	1.4	Tasks are planned and sequenced in conjunction with others

- involved in or affected by maintenance work
- 1.5 Consumables and equipment are selected and checked for serviceability
- 1.6 Maintenance plan is accessed to determine maintenance requirements for engines, propulsion plant and auxiliary systems
- 2 Complete preventative maintenance**
 - 2.1 Machinery and equipment is safely isolated according to work health and safety (WHS)/occupational health and safety (OHS) requirements and organisational practices
 - 2.2 WHS/OHS risk control measures and procedures for carrying out work are followed
 - 2.3 Work area is prepared
 - 2.4 Preventative maintenance is carried out in compliance with technical specifications
 - 2.5 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes
 - 2.6 Maintenance work is checked to verify that it conforms to technical specifications and complies with survey requirements where applicable
- 3 Complete breakdown maintenance**
 - 3.1 Nature of breakdown is confirmed using maintenance records and/or logbook entries related to reported breakdown
 - 3.2 Restrictions are applied to operations, where necessary, and Master is informed
 - 3.3 Machinery and equipment is safely isolated according to WHS/OHS requirements and organisational practices
 - 3.4 Repair work is carried out according to technical specifications
 - 3.5 Master is notified of completion of repair work and details are documented
- 4 Complete hull maintenance**
 - 4.1 Checks of vessel hull, equipment and fittings are carried out according to maintenance schedules, survey requirements and vessel manufacturer instructions
 - 4.2 Deterioration in vessel structure, equipment and fittings is identified

	4.3	Checks on propeller, stern tube and rudder are carried out in accordance with organisational procedures ,safety regulations and survey requirements
	4.4	WHS/OHS risk control measures and procedures for carrying out work are followed
	4.5	Work area is prepared
	4.6	Maintenance work is checked to verify it conforms to technical specifications and complies with survey requirements where applicable
5	Clean up and complete documentation	
	5.1	Work area is cleared and cleaned
	5.2	Materials are disposed of or recycled according to legislative and workplace requirements
	5.3	Tools and equipment are cleaned, checked and stored according to workplace procedures
	5.4	Machinery and equipment is returned to service and monitored for correct operation according to organisational practices
	5.5	Maintenance report is completed according to workplace procedures
	5.6	Work area is cleared and cleaned

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.

Maintenance requirements include one or more of the following:

- cleaning:
 - filters
 - coolers
- greasing
- maintaining emergency equipment
- oiling
- oily water separator
- overhauling and repairing pumps
- scheduled survey inspections
- topping up oils

Engines, propulsion plant and auxiliary systems include one or more of the following:

- auxiliary equipment and associated spaces
- cooling systems
- deck machinery
- fixed firefighting systems
- fuel systems
- gearbox
- hull fittings
- lubricating systems
- marine two- and four-stroke:
 - diesel engines
 - petrol engines
- propeller and immediate shafting alignment
- pumping systems
- refrigeration systems
- steering systems
- sterndrive and water jet drive units

Consumables and equipment include one or more of the following:

- cleaning chemicals
- coolants
- hand and power tools
- oils and grease
- refrigerant gas
- replacement parts
- test equipment

Nature of breakdown includes one or more of the following:

- cooling water system failure
- engine failure
- exhaust systems
- fuel system failure
- gearbox failure
- lubricating systems failure
- power plant failure
- propeller and shafting arrangements
- pumping systems failure
- refrigeration plant failure
- steering gear failure

Checks of vessel hull, equipment and fittings include one or more of the following:

- anodes
- intake grates
- keel coolers
- ship side valves
- watertight hatches and openings

Materials include one or more of the following:

- rags
- spent oil

Unit Mapping Information

This is a new unit.

This unit is equivalent to MARB3006A Maintain marine internal combustion engines, propulsion plant and auxiliary systems.

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 MARB006 Maintain marine internal combustion engines, propulsion plant and auxiliary systems

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 on at least one occasion and include:

- applying safety requirements throughout the work sequence including the use of personal protective equipment (PPE)
- completing:
 - all work to specification
 - basic user maintenance of marine internal combustion engine, propulsion plant and auxiliary systems to manufacturer specifications and survey requirements, so as to prevent pollution of the marine environment
 - maintenance records
- developing effective planning documents
- implementing safe and environmentally responsible work practices
- planning maintenance activities according to technical, legislative, safety and procedural specifications
- reading and interpreting manufacturer specifications and safety data sheets (SDS)/material safety data sheets (MSDS).

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:

- basic hydraulic systems and user maintenance requirements
- basic vessel construction
- bearing types, materials, installation and lubrication
- common faults in:
 - steering gear
 - refrigeration systems
- construction and maintenance of heat exchangers
- correct pressure and flow conditions
- corrosion prevention

- coupling types, fitting, keys and keyways
- cross connections between:
 - sea water systems and bilge systems
 - bilge/ballast/seawater systems and fire main
- dangers associated with:
 - back-flooding and methods to prevent back-flooding
 - liquefied petroleum gas (LPG) and petrol vapours
- dangers of refrigerant gas leaks in confined spaces
- diesel engine
 - construction
 - fuel injection, timing and control equipment
 - routine maintenance
- engine:
 - fault finding techniques
 - performance and reasons for lack of performance
 - protection arrangements
- electro-hydraulic steering gear
- emergency steering systems
- faults that can occur with firefighting equipment and systems
- fire main system and components including pumps, hoses and nozzles
- fixed firefighting systems and associated remote shut-offs and closing of appliances
- heat exchanger, keel cooler and raw water cooling systems
- glands, packing and seals
- maintenance of watertight openings and hull fittings
- marine gearbox faults and emergency operation
- method of propulsion reversal including controllable pitch propeller construction
- oil:
 - filter changing procedures
 - quality monitoring
- planned maintenance
- propeller types, fitting, keys and keyways, securing nuts , locking
- pump capabilities and requirements for priming
- refrigeration systems and components
- relevant regulations and codes of practice relating to the maintenance of engineering equipment and systems such as firefighting
- routine maintenance:
 - on steering systems
 - of refrigeration systems
- rudder and stock bearing supports
- rudder construction and rudder types
- seawater circulating systems

- shutting down machinery
- statutory and organisational requirements for documentation relating to the maintenance of engineering equipment and systems such as firefighting
- storage of LPG cylinders
- testing of LPG detectors
- tiller arm attachment
- types of:
 - deck machinery
 - pumps and safety devices
 - wet sump lubrication systems.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB007 Undertake basic maintenance of electrical systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to complete basic maintenance of electrical systems.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Steam or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

WARNING: Relevant state/territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.

Relevant state/territory electrical licensing requirements apply to persons carrying out installation, maintenance and/or repair of electrical circuits or systems that are 50 V alternating current (AC) or above, or 120 V direct current (DC) or above, on a vessel.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

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 maintenance activities	1.1 Maintenance plan is accessed to determine electrical system maintenance requirements 1.2 Inspections are conducted and additional non-routine maintenance requirements are determined 1.3 System specifications and diagrams for electrical systems are obtained 1.4 Tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work 1.5 Consumables and equipment are selected and checked for serviceability
2 Complete preventative maintenance	2.1 Electrical system is safely isolated according to regulatory and work health and safety (WHS)/occupational health and safety (OHS) requirements 2.2 WHS/OHS risk control measures and procedures for carrying out work are followed 2.3 Preventative maintenance is carried out in compliance with system specifications 2.4 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes 2.5 Work is carried out efficiently without waste of materials and damage to equipment and machinery or other services 2.6 Maintenance work is checked to verify that it conforms with technical specifications
3 Complete breakdown maintenance	3.1 Nature of breakdown is confirmed using maintenance records and/or log book entries related to reported breakdown 3.2 Restrictions are applied to operations, if necessary, and Master is notified 3.3 Limits of repair work that can be carried out are established according to relevant state/territory electrical licensing requirements 3.4 System is isolated 3.5 Repair work is carried out according to system specifications

	3.6	Master is notified of completion of repair work and details are documented
4 Clean up and complete documentation	4.1	Work area is cleared and cleaned
	4.2	Materials are disposed of or recycled according to legislative and workplace requirements
	4.3	Tools and equipment are cleaned, checked and stored according to workplace procedures
	4.4	Electrical system and equipment are put back into service and monitored for correct operation according to organisational practices
	4.5	Maintenance report is completed according to workplace 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.

- Electrical systems include one or more of the following:
- AC generators
 - alarm systems
 - batteries
 - emergency electrical supply
 - emergency generators
 - generators
 - motor starting circuits

	• power and lighting • shore supply • steering gear circuits • switchboards
Maintenance requirements include one or more of the following:	• battery maintenance • motor replacement • replacing: • light bulbs • faulty wiring • testing: • alarm systems • emergency generator • power and lighting systems
Consumables and equipment include one or more of the following :	• hand and power tools rated for electrical work • replacement parts • test equipment •
Nature of breakdown include one or more of the following:	• blown fuses or open circuit breakers • earthing • failure of electricity generating systems • motor brake failure to release • motor failure • shorting
Materials include one or more of the following :	• batteries • damaged wiring • used lamps • rags

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB3007A Undertake basic maintenance of electrical systems.

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 MARB007 Undertake basic maintenance of electrical systems

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 on at least one occasion and include:

- carrying out simple maintenance of electrical systems
- implementing safe and environmentally responsible work practices
- reading and interpreting system specifications.

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:

- battery:
 - charging systems
 - maintenance
 - types and associated hazards
- connecting batteries in series and parallel
- connection to shore power
- earth indicating devices
- electrical distribution systems
- isolation of electrical circuits
- main faults that can occur in:
 - AC electrical systems
 - DC electrical systems
- maintenance and operation of batteries
- own ability and limits to rectify irregularities and faults
- protection devices
- single and three-phase AC power
- starter motors, alternators and associated equipment
- switchboard and protection devices
- uses of fuses and circuit breakers
- use of multi-meter to test voltage and continuity.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB008 Carry out basic welding, brazing, cutting and machining operations on a coastal vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to carry out basic welding, brazing, cutting and machining tasks.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

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 Carry out basic welding tasks

1.1	Requirements for welding tasks are correctly interpreted from work instructions
1.2	Parts are prepared for welding according to established practice
1.3	Parts are welded according to established practice and work requirements

	1.4	Weld defects are identified and appropriate action is taken according to established practice and standard operating procedures
	1.5	Flame gouging methods are used to remove plate and weld material according to established practice and standard operating procedures
	1.6	Finished work is checked against work instructions for accuracy and quality
2 Carry out basic brazing tasks	2.1	Requirements for brazing tasks are correctly interpreted from work instructions
	2.2	Parts are prepared for brazing according to established practice and work requirements
	2.3	Brazing equipment is prepared for brazing operations according to established procedures
	2.4	Parts are brazed using established procedures
	2.5	Finished work is checked against work instructions for accuracy and quality
3 Carry out basic cutting tasks	3.1	Instructions are reviewed, and required size and shape of cut work is correctly identified and interpreted
	3.2	Work is correctly marked out in preparation for cutting according to established practice and standard operating procedures
	3.3	Thermal cutting plant and equipment is set up according to established procedures
	3.4	Steel plate and/or rolled sections are cut to shape and size according to established practice and standard operating procedures
	3.5	Finished work is checked against work instructions for accuracy and quality according to standard operating procedures
4 Carry out basic machining tasks	4.1	Requirements for basic machining tasks are correctly interpreted from work instructions according to standard operating procedures
	4.2	Work is correctly marked out in preparation for basic machining according to established practice and standard

		operating procedures
	4.3	Machine is set up according to established procedures
	4.4	Machining is carried out according to established procedures
	4.5	Finished work is checked against work instructions for accuracy and quality according to standard operating procedures
5	Follow safety and hazard control procedures	
	5.1	Required safety precautions and regulations are followed when carrying out basic welding
	5.2	Operational hazards are identified and action is taken to eliminate, or where elimination is not possible to minimise, risk to personnel

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.

Operational hazards include one or more of the following:

- moving and rotating machinery
- moving heavy loads using unsafe procedures
- non-compliance with safe working procedures
- poor housekeeping procedures
- power tools
- sharp tools and implements
- unsecured machinery, components or equipment
- using equipment beyond safe working limits

- using welding equipment near explosive/flammable liquids and gases

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB4001A Carry out basic welding, brazing, cutting and machining operations on a coastal 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 MARB008 Carry out basic welding, brazing, cutting and machining operations on a coastal 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 on at least one occasion and include:

- carrying out basic welding, brazing, cutting and machining tasks while underway, in port and moored or at anchor
- cleaning, sharpening or adjusting tools according to standard operating procedures
- dressing and truing a grinding wheel
- following required work schedule according to company requirements
- identifying a glazed, loaded or untrue grinding wheel condition and taking appropriate action
- marking out work to specifications, and measuring and checking the quality of finished work
- performing basic calculations required to carry out basic welding, brazing, cutting and machining operations
- reading and interpreting work specifications and drawings
- reading, interpreting and applying instructions and standard operating procedures relevant to basic welding, brazing, cutting and machining operations required on a coastal vessel
- recognising routine problems that may occur when performing basic welding, brazing, cutting and machining operations on a vessel and taking appropriate action
- selecting and safely using welding, brazing, cutting and machining tools and equipment according to operating procedures
- storing welding, brazing, cutting and machining tools and equipment after use according to standard procedures
- taking action promptly to report operational incidents and problems according to regulations and shipboard procedures
- using effective verbal and other communication skills required when carrying out basic welding, brazing, cutting and machining operations on a vessel
- working safely and collaboratively with others when carrying out basic welding, brazing, cutting and machining operations on a vessel.

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:

- applicable sections of relevant maritime regulations
- applicable legislation, regulations and codes of practice:
 - National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
 - relevant Australian engineering standards
 - relevant state and territory marine regulations
 - relevant work health and safety (WHS)/occupational health and safety (OHS) and pollution control legislation and policies
- basic operations within area of own responsibility:
 - basic fillet welds
 - basic butt welds
 - basic pad welds
 - manual metal arc welding
 - oxygen acetylene welding
 - basic machining operation
- characteristics and identifying features of common engineering drill bits
- documentation and records:
 - maintenance records
 - manufacturer instructions for tools and equipment
 - relevant safety data sheets (SDS)/material safety data sheets (MSDS)
 - safety management system plans, procedures, checklists and instructions
 - work instructions
 - vessel and company procedures
- environmental protection measures when carrying out basic engineering tasks
- hazards and related safety precautions when carrying out basic welding, brazing, cutting and machining tasks
- procedures for:
 - identifying a glazed, loaded or untrue grinding wheel condition
 - dressing and/or truing a grinding wheel
- safety management system and procedures
- standard operating procedures for basic welding, brazing, cutting and machining tasks required of a Marine Engine Driver Grade 1
- standard procedures for marking out work to specifications and measuring and checking the quality of finished work, including the correct use of:
 - adjustable gauge
 - callipers
 - centre punch hammers
 - dividers
 - rules and tapes
 - scribes
 - squares

- trammels
- vernier callipers and micrometer
- techniques for identifying defective welds within limits of responsibility
- types, names and identifying features of drilling machines used on coastal maritime vessels
- typical work specifications and drawings used on a coastal vessel.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB009 Manage refuelling

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage refuelling and fuel transfer operations.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

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 refuelling or fuel transfer operations

- 1.1 Fuel tanks are dipped to establish current level of fuel
- 1.2 Fuel is ordered according to organisational procedures
- 1.3 Amount and positioning of fuel on board vessel is calculated with reference to tank tables
- 1.4 Impact of refuelling on safety and operation of vessel is determined and appropriate strategies are implemented

	1.5	Local port authorities are informed of vessel location for bunkering operations and duration of bunkering
2 Prepare vessel for refuelling or fuel transfer operations	2.1	Vessel is positioned and secured for refuelling
	2.2	All personal protective equipment is accessed and used
	2.3	Bunkering equipment is correctly deployed according to organisational procedures
	2.4	Safety zone for refuelling process is established and maintained for full duration of operation
	2.5	Procedures for refuelling are established with bunker operator and completed lists are checked according to organisation and safety management system (SMS) requirements
	2.6	Bunker hose is securely connected to vessel fuel manifold
	2.7	Tank valves are opened as necessary and refuelling operations are performed safely according to SMS and regulatory requirements
	2.8	Tanks are dipped to ensure correct amount of fuel has been received
	2.9	Fuel samples are taken to check quality of fuel received and appropriate action is taken if fuel sample is off speculation
3 Complete refuelling operations	3.1	Shut-down procedures are conducted according to organisational procedures
	3.2	Malfunctions, faults, irregular performance or damage to refuelling equipment are recorded and repairs are organised, according to organisational procedures
	3.3	Refuelling equipment is maintained and secured according to organisational procedures
	3.4	Refuelling records are completed according to organisational procedures and regulatory requirements
4 Manage an emergency	4.1	Appropriate response is made to an emergency situation according to organisational procedures
	4.2	Safety zone is closed off and isolated according to organisational procedures

- 4.3 All persons in the safety zone are correctly notified and their activities are managed to ensure safety according to organisational procedures
- 4.4 Appropriate authorities are notified and actions are taken as directed according to emergency procedures and regulatory requirements
- 4.5 Documentation of emergency is completed according to organisational procedures and relevant maritime authority

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.

Impact of refuelling on safety and operation of vessel include one or more of the following:

- hot work
- increase in the potential for fire
- loading and discharging operations
- stability including the effect of free surface
- toxic fumes
- work being conducted by shore contractors

Personal protective equipment must include:

- gloves
- overalls
- work boots

- Bunkering equipment includes one or more of the following :
- bunding
 - bunker flag
 - fire extinguishers
 - no smoking signs
 - radios
 - sample containers
 - scupper plugs
 - sounding tape
 - spill kit
- Safety zone includes one or more of the following:
- area where no smoking or hot work is permitted
 - area that can contain a spill
- Procedures for refuelling includes one or more of the following:
- establishing:
 - flow rates
 - system of communication with supplier in relation to starting and shut-down procedures
 - emergency disconnection procedures
- Shut-down procedures include one or more of the following:
- blowing through of bunker hoses
 - disconnecting bunker hose
 - isolating fuel valves
 - stowing equipment
- Refuelling records include one or more of the following:
- bunker receipt
 - log book entry
 - oil record book
- Emergency situations include one or more of the following:
- broken mooring lines
 - fire
 - oil spill
- Documentation includes one or more of the following:
- incident report forms
 - logbook entry

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB4003A Manage refuelling.

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 MARB009 Manage refuelling

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 on at least one occasion and include:

- completing required records
- implementing procedures for dealing with an oil spill
- measuring tank levels
- recognising faulty equipment and taking appropriate action
- recognising problems and hazards during refuelling and fuel transfer operations, and taking appropriate action
- selecting and using relevant equipment required for refuelling and fuel transfer operations
- taking appropriate action in an accidental spillage, fire or safety incident during refuelling and fuel transfer operations.

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:

- environmental protection measures to be applied during refuelling or transfer operations
- functions and responsibilities of crew during refuelling or transfer operations
- hazards and safety precautions to be observed during refuelling or transfer operations
- own ability and limits to rectify irregularities and faults
- refuelling and fuel transfer procedures applying to commercial vessels
- requirements for reporting incidents
- work health and safety (WHS)/occupational health and safety (OHS) and pollution control legislation and policies.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB010 Plan and supervise routine maintenance on a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to implement a maintenance program for a vessel up to 80 metres.

This unit applies to people working in the maritime industry 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

B – Equipment Checking and Maintenance

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 Develop maintenance program

- 1.1 Planned maintenance system is accessed to establish maintenance requirements for vessel
- 1.2 Maintenance program for vessel is developed to meet requirements of planned maintenance system
- 1.3 Maintenance schedules and budgets are identified

	1.4	Suggestions that support effective implementation of maintenance program are offered according to organisational procedures
	1.5	Strategies to minimise impact of maintenance activities on vessel operations are identified
2 Implement maintenance program	2.1	Routine maintenance activities are proposed and prioritised in conjunction with others involved in or affected by maintenance work
	2.2	Routine maintenance activities are allocated within scheduled timeframes and budgets according to organisational procedures
	2.3	Vessel operations are maintained where possible without interruption
	2.4	Safety of crew is maintained at all times according to relevant legislation and organisational procedures
	2.5	Requests for assistance from crew to complete maintenance activities are responded to promptly
3 Identify failed or unsafe machinery and equipment	3.1	Faulty machinery and equipment is identified and clear and noticeable warning signs are erected according to organisational procedures
	3.2	Failed or unsafe machinery and equipment is assessed according to organisational procedures
	3.3	Repairs are allocated to appropriate crew members according to organisational procedures
	3.4	Unsafe machinery and equipment which cannot be repaired is promptly tagged and isolated according to organisational procedures
	3.5	Unsafe machinery and equipment is promptly reported according to organisational procedures
	3.6	Reports on all repair work undertaken are completed according to organisational procedures
4 Monitor supplies	4.1	Supply and stock levels are maintained to ensure ongoing availability
	4.2	Management of supplies is undertaken according to organisational procedures

- 4.3 Supply and stock levels are reconciled and any discrepancies are rectified or reported
- 4.4 Supply records are maintained 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.

- Planned maintenance system must include:
- anchoring equipment
 - communications equipment
 - compliance with applicable mandatory rules and regulations, including work health and safety (WHS)/occupational health and safety (OHS) and environment protection legislation
 - continuous improvement and review procedures
 - document control procedures
 - firefighting equipment
 - identifying hazards and risk management
 - lifesaving equipment
 - navigation equipment
 - procedures for updating and correcting charts, publications and electronic chart information
 - provision of safe practices in vessel operation and a safe working environment
 - reference to applicable codes, guidelines and standards
 - steering gear

	• systems for recording completed maintenance schedules, including identification of defective equipment and rectification of defects
Maintenance program must include:	• lines of communication and relationship between vessel and owner • periodic survey requirements • procedure for programmed maintenance of hull and machinery • regular inspection of all equipment referred to in planned maintenance system • routine maintenance as contained in manufacturer instruction manuals and drawings • safety and environmental policy
Routine maintenance activities include one or more of the following:	• checking life saving appliances • inspecting breathing apparatus • navigational equipment • operation of emergency firefighting equipment including fire hoses and nozzles • servicing equipment as required by service manuals and manufacturer instructions relating to vessel equipment • testing communication equipment, including distress calling • testing lifting equipment
Machinery and equipment includes one or more of the following:	• fire pumps • navigational equipment • steering gear and emergency steering gear • winches and windlasses
Management of supplies include one or more of the following:	• issue • purchase • receipt • stock control • storage

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB4005A Plan and supervise routine maintenance on a vessel up to 80 metres.

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 MARB010 Plan and supervise routine maintenance on a vessel up to 80 metres

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 on at least one occasion and include:

- effectively liaising with internal and external authorities/agencies
- initiating timely action in response to defects or damage
- interpreting planned maintenance system to determine maintenance requirements
- managing maintenance of vessel
- monitoring selection and use of supplies involved in maintenance of vessel
- preparing reports on outcomes of inspection and maintenance activities
- reading and interpreting safety data sheets (SDS)/material safety data sheets (MSDS)
- reading and interpreting vessel, equipment and machinery specifications, drawings, operational manuals and diagrams
- taking appropriate precautions to prevent pollution of marine environment.

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:

- elements of ship structure crucial to the safety of the ship
- fundamental principles of vessel construction
- maintenance records that must be maintained on vessel to meet organisational and statutory requirements
- nature and causes of corrosion of marine surfaces and structures, and available means for control
- principal structural components
- procedures for initiation and coordination of repair and/or replacement procedures on board vessel
- relevant laws and regulations including work health and safety (WHS)/occupational health and safety (OHS) and pollution control legislation
- slipping and docking procedures suitable for various types of hull forms
- typical problems related to maintenance of vessels and appropriate actions and solutions.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB011 Undertake maintenance of 240 to 440 voltage alternating current electrical systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform establish, organise and implement a preventative and reactive maintenance program and capabilities on 240 to 440 voltage alternating current (AC) electrical systems on a vessel.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

WARNING: Relevant state/territory qualification requirements apply to persons carrying out installation, maintenance and/or repair of refrigeration equipment, especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

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 Verify maintenance requirements

1.1 Regulatory and organisational requirements for electrical system maintenance program are identified and followed

1.2 Specifications, diagrams and organisational procedures for electrical systems are checked for recommended

- 1.3 Special requirements for electrical system maintenance are separated from adjustment and day-to-day maintenance schedules
- 1.4 Maintenance system goals for electrical systems are outlined
- 1.5 Maintenance plan and related work schedule for electrical systems are developed according to regulatory requirements and safety management system (SMS)

2.1	Maintenance costs are identified and quantified
2.2	Interruptions, processes and procedures are documented
2.3	Internal and external maintenance providers are specified
2.4	Maintenance plan is prepared to minimise negative impacts on production, costs, waste and the environment
2.5	Approvals for maintenance plan are negotiated and confirmed
2.6	Recordkeeping systems are developed and maintained

- 3.1 Schedules and rosters are checked to verify time when maintenance process may be scheduled, including optimal timing for shut down
- 3.2 Agreement from Master is obtained for timing of maintenance tasks to optimise maintenance process and minimise operational disruptions
- 3.3 Detailed work plans are developed in line with schedules, availability of expertise and scheduling of resource availability
- 3.4 Team members with required competencies are allocated to maintenance activities
- 3.5 Consumables and equipment are secured to meet work plan requirements
- 3.6 Externally sourced equipment, consumables and expertise are located and procured
- 3.7 Contingency plans are prepared
- 3.8 Maintenance schedules and procedures are effectively

- communicated to team
- 4 Supervise maintenance tasks**
- 4.1 Job specifications and maintenance tasks are communicated effectively to team members
 - 4.2 Maintenance and repair tasks are monitored to ensure they satisfy system specifications
 - 4.3 Work health and safety (WHS)/occupational health and safety (OHS) requirements are monitored and observed at all times
 - 4.4 Emergency equipment is made available and working order of this equipment is ensured
 - 4.5 Contingencies are managed to ensure quality of work is maintained and work is completed within agreed timeframe
- 5 Perform planned maintenance activities**
- 5.1 WHS/OHS risk control measures and procedures for carrying out work are followed
 - 5.2 Maintenance schedule and process compliance requirements are confirmed and work is appropriately sequenced according to job specification
 - 5.3 Appropriate person/s are consulted to ensure work is coordinated effectively with others
 - 5.4 Resources needed to conduct maintenance are obtained according to organisational procedures and are checked against job requirements
 - 5.5 Tools, equipment and testing devices needed to conduct maintenance are obtained according to organisational procedures and checked for correct operation and safety
 - 5.6 Live and operating system is tested or measured strictly according to WHS/OHS requirements and within established safety procedures
 - 5.7 Electrical equipment is checked as being isolated where necessary, strictly according to WHS/OHS requirements and within established safety procedures
 - 5.8 Electrical equipment to be maintained is inspected and evaluated for compliance with system specifications
 - 5.9 Noncompliant electrical equipment components are rectified or repaired according to system specifications

6 Perform breakdown maintenance	6.1 Nature of breakdown is confirmed with appropriate personnel
	6.2 Extent of breakdown is evaluated and confirmed using diagnostic and troubleshooting techniques
	6.3 Restrictions are applied to operations, if necessary, and agreed to with the Master
	6.4 Electrical equipment is checked as being isolated where necessary, strictly according to WHS/OHS requirements and within established safety procedures
	6.5 Repair work is carried out according to system specifications
	6.6 Master is notified of completion of repair work and details are documented
7 Monitor, adjust and report on implementation of maintenance plan	7.1 Maintenance tasks are monitored to ensure they are completed according to maintenance plan and statutory survey requirements
	7.2 Electrical systems are monitored to ensure achievement of planned outcomes
	7.3 Costs are monitored and controlled
	7.4 Adjustments are made to maintenance plan to take into account failure to achieve planned outcomes
	7.5 Reports are completed according to maintenance plan requirements and organisational procedures
	7.6 Recommendations to improve maintenance plan safety, efficiency and effectiveness are implemented under regular review of SMS
	7.7 Maintenance tasks are monitored to ensure they are completed according to maintenance plan and statutory survey requirements

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.

Electrical systems include one or more of the following:

- AC generators
- alarm systems
- batteries
- electrical motor starting circuits
- emergency electrical supply
- emergency generators
- generators
- power and lighting
- shore supply
- steering gear
- switchboards

Special requirements for electrical system maintenance include one or more of the following:

- breakdown maintenance
- periodic inspections and surveys

Maintenance tasks include one or more of the following:

- battery maintenance
- generator servicing
- replacing faulty wiring
- testing:
 - alarm systems
 - emergency generator
- power and lighting systems

Consumables and equipment include one or

- replacement parts
- testing equipment

more of the following:

- tools and equipment rated for electrical work

Emergency equipment includes one or more of the following:

- alarm systems
- emergency generator
- firefighting equipment
- lifesaving equipment
- pump operations

Nature of breakdown includes one or more of the following:

- failure of electricity generating systems
- generator failure

Restrictions include one or more of the following:

- stopping main engine
- stopping one generator
- switching to emergency power

Reports include one or more of the following:

- incident reports
- maintenance log
- operational orders from organisation SMS
- reports required under planned maintenance system
- survey reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB4006A Undertake maintenance of 240 to 440 voltage alternating current electrical systems.

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 MARB011 Undertake maintenance of 240 to 440 voltage alternating current electrical systems

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 on at least one occasion and include:

- applying safety requirements throughout work sequence including the use of personal protective equipment (PPE)
- completing all work to specification
- developing effective planning documents
- ensuring correct requirements and details of maintenance of electrical systems and equipment
- implementing safe and environmentally responsible work practices in testing and maintenance activities
- locating, interpreting and applying manufacturer specifications for electrical systems and equipment
- operating AC systems and conducting operator preventive maintenance according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- operating electrical systems and equipment according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation providing high quality reports
- recognising electrical system faults and where necessary taking steps to make them immediately safe
- selecting and using appropriate processes, tools and equipment.

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:

- AC systems not exceeding 440 voltage AC
- batteries (types, care and maintenance, hazards)
- care of electrical systems and equipment in general (fault recognition)
- charging systems:
 - alarms/indicators
 - regulators

- connecting batteries
- electric systems (above 240 V AC and up to 440 V AC)
- fault identification, location and safety implications
- operation and maintenance of starter motors, alternators and associated equipment
- personal safety
- protective devices on switchboards
- shore power connection
- use of fuses and circuit breakers (selection of correct capacity).

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB012 Undertake maintenance of machinery, machinery systems and structural components

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to establish, organise and implement a preventative and reactive maintenance program and capabilities for machinery, machinery systems and structural components to optimise vessel operational performance.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

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 **Verify maintenance requirements**

1.1	Maintenance program regulatory and organisational requirements for machinery, machinery systems and structural components are identified and followed
1.2	Technical specifications, service requirements and organisational procedures for machinery, machinery systems and structural components are checked for recommended

- maintenance requirements
 - 1.3 Special requirements for maintenance of machinery, machinery systems and structural components are separated from normal lubrication, adjustment and day-to-day maintenance schedules
 - 1.4 Maintenance system goals for machinery, machinery systems and structural components are outlined
 - 1.5 Maintenance plan and related work schedule for machinery, machinery systems and structural components is developed
- 2 **Establish maintenance systems**
 - 2.1 Maintenance costs are identified and quantified
 - 2.2 Processes, procedures and delays are documented
 - 2.3 Internal and external maintenance providers are specified
 - 2.4 Maintenance plan is prepared to minimise ship operation costs, waste and harm to the environment
 - 2.5 Approvals for maintenance plan are negotiated and confirmed
 - 2.6 Recordkeeping systems are developed and maintained
- 3 **Organise maintenance activities**
 - 3.1 Schedules and rosters are checked to verify time when maintenance process may be scheduled, including optimal timing for shut down
 - 3.2 Agreement with the Master is obtained for timing of maintenance tasks to optimise maintenance process and minimise operational disruptions
 - 3.3 Detailed work plans are developed in line with schedules, availability of expertise, scheduling of resource availability and environmental requirements
 - 3.4 Team members with required competencies are allocated to maintenance activities
 - 3.5 Consumables and equipment are secured to meet work plan requirements
 - 3.6 Externally sourced equipment, consumables and expertise are located and procured
 - 3.7 Contingency plans are prepared

	3.8	Maintenance schedules and procedures are effectively communicated to the team
4 Supervise maintenance tasks	4.1	Job specifications and maintenance tasks are communicated effectively to team members
	4.2	Maintenance and repair tasks are monitored to ensure they satisfy technical specifications
	4.3	Work health and safety (WHS)/occupational health and safety (OHS) requirements are monitored and observed at all times
	4.4	Emergency equipment is made available and working order of this equipment is ensured
	4.5	Contingencies are managed to ensure quality of work is maintained and work is completed within agreed time frame
5 Perform planned maintenance activities	5.1	WHS/OHS risk control measures and procedures for carrying out work are followed
	5.2	Preventative maintenance is carried out in compliance with technical specifications
	5.3	Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes
	5.4	Ongoing quality checks of maintenance work are undertaken according to technical specifications
	5.5	Work is carried out efficiently without waste of materials and damage to equipment, machinery or other services
	5.6	Work site is made safe according to organisational safety procedures
	5.7	Maintenance work is checked to verify that it conforms with technical specifications
6 Perform breakdown maintenance	6.1	Nature of breakdown is ascertained and reported to appropriate personnel or authorities
	6.2	Maintenance records of machinery, machinery systems and structural components related to reported breakdown are reviewed for possible causes
	6.3	Extent of breakdown is evaluated and confirmed using diagnostic and troubleshooting techniques

- 6.4 Restrictions are applied to operations where necessary and agreed to with the Master
- 6.5 Extent of repair work is ascertained from available evidence
- 6.6 Limits of repair work that can be carried out are established
- 6.7 Machinery and equipment is isolated
- 6.8 Repair work is carried out according to technical specifications
- 6.9 Master is notified of completed repair work and details are documented
- 7 **Monitor, adjust and report on implementing the maintenance plan**
 - 7.1 Execution of maintenance tasks is monitored to ensure they are completed according to maintenance plan and statutory survey requirements
 - 7.2 Machinery, machinery systems and structural components are monitored to ensure achievement of planned outcomes
 - 7.3 Costs are monitored and controlled
 - 7.4 Adjustments are made to maintenance plan to take into account failure to achieve planned outcomes
 - 7.5 Reports are completed according to maintenance plan requirements and organisational procedures
 - 7.6 Recommendations to improve maintenance plan safety, efficiency and effectiveness are implemented under regular review of safety management system
 - 7.7 Machinery, machinery systems and structural components are maintained in a clean and safe operational condition
- 8 **Carry out damage control procedures**
 - 8.1 Damage to vessel hull and watertight integrity is ascertained and monitored according to established procedures and safety regulations
 - 8.2 After hull damage, appropriate damage control measures are implemented to maintain watertight integrity and to control flooding of vessel according to vessel emergency and safety management plans

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.

Machinery, machinery systems and structural components include one or more of the following:	• electrohydraulic steering gear • engine and gearbox: • cooling systems • lubricating systems • engine fuel systems • gearbox • hydraulic systems including steering gear • pumps and pumping systems for bilge, fuel oil, freshwater and seawater systems • refrigeration plant and its operation • refrigeration system components • steering gear • transmission systems from engine output shaft to propeller • two- and four-stroke diesel engines
Special requirements for maintenance include one or more of the following:	• asbestos awareness • awareness of confined and restricted space operations • dry docking • handling refrigerant gas within regulatory requirements
Maintenance tasks include one or more of the following:	• cleaning: • coolers • filters

- greasing
- maintaining:
 - emergency equipment
 - firefighting and lifesaving equipment
- oiling
- oily water separator
- overhauling and repairing pumps
- scheduled survey inspections
- topping up oils

Consumables and equipment include one or more of the following:

- cleaning chemicals
- coolants
- hand and power tools
- oils and grease
- refrigerant gas
- replacement parts
- test equipment

Emergency equipment includes one or more of the following:

- communication equipment
- emergency lighting
- firefighting equipment
- first aid provisions
- lifesaving equipment

Nature of breakdown includes one or more of the following:

- cooling water system failure
- engine failure
- exhaust systems
- fuel system failure
- gearbox failure
- loss of control systems
- lubricating systems failure
- power plant failure
- propeller and shafting arrangements
- pumping systems failure
- refrigeration plant and its operation
- steering gear failure

Restrictions applied to operations include one or

- stopping or slowing main engine
- switching to emergency power

more of the following:

- Reports include one or more of the following:
- incident reports
 - maintenance log
 - reports required under planned maintenance system
 - survey reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB4007A Undertake maintenance of machinery, machinery systems and structural components.

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 MARB012 Undertake maintenance of machinery, machinery systems and structural components

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 on at least one occasion and include:

- completing maintenance records
- developing effective planning documents
- implementing safe and environmentally responsible work practices
- managing legislative compliance and compliance records
- planning and organising application of control techniques for hull damage
- planning and preparing for maintenance including isolating equipment
- providing high quality report
- reading, interpreting and applying:
 - manufacturer instructions including all WHS/OHS requirements and safety data sheets (SDS)/material safety data sheets (MSDS)
 - operating and service manuals
- recognising damage to hull of small vessel and taking appropriate action according to operating instructions
- recognising faulty equipment including:
 - cooling water system corrosion
 - fuel oil contamination
 - lubricating oil contamination
- repairing pipe work
- selecting and using correct tools and equipment for maintenance task
- servicing valves.

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:

- appropriate mathematical procedures for estimating and measuring including calculating time to complete tasks
- back-flooding and down-flooding
- causes of vibrations and undue wear in power transmission system

- construction, layout and subdivision requirements of a typical vessel, including freeboard and bulkhead deck, watertight compartments, weather tight compartments and bulkheads of vessel
- costs of material, consumables and labour
- environmental protection requirements including safe disposal of waste material, safe use and storage of chemicals, and safe handling and storage of LPG
- environmental risks and hazards
- inspections to be undertaken on vessel hull during slipping or dry docking
- maintenance procedures and methodologies for:
 - batteries
 - cooling water systems including treatment
 - fuel systems including contamination
 - heat exchangers
 - hull maintenance including use of sacrificial anodes
 - hydraulic systems
 - lifesaving appliances
 - lubricating oil systems including contamination
 - power transmission systems
 - steering systems
 - starter motors, alternators and associated equipment
- material and stress characteristics in constructing a vessel
- methods of corrosion and how to prevent corrosion
- organisational requirements, policies and procedures for organising maintenance programs
- principal features of structure of a vessel
- procedures for recording and reporting workplace information
- types of tools and equipment, and procedures for their safe use and maintenance
- valve types and construction.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARB013 Maintain and repair marine electrical and electronic equipment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to maintain and repair marine electrical and electronic equipment on a vessel. This includes carrying out routine maintenance of marine generators, switchboards, electric motors, motor starters, direct current (DC) electrical systems and electrical distribution systems; and identifying faults in automated control systems.

This unit applies to the work of a Marine Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

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 Maintain marine generators

1.1 Safety requirements associated with working on marine electrical generation systems are complied with

1.2 Marine generators are inspected using appropriate manuals and drawings according to regulatory, organisational and

- manufacturer requirements
- 1.3 Routine maintenance and testing of marine generators is performed according to regulatory, organisational and manufacturer requirements
 - 1.4 Alternators are synchronised according to organisational and manufacturer requirements
 - 1.5 Testing and maintenance records are maintained according to regulatory, organisational and manufacturer requirements
- 2 Maintain marine switchboards**
- 2.1 Safety requirements associated with handling circuit breakers are complied with
 - 2.2 Routine maintenance is performed on main circuit breaker according to with regulatory, organisational and manufacturer requirements
 - 2.3 Faults in circuit breakers are detected and corrected according to regulatory, organisational and manufacturer requirements
 - 2.4 Testing and maintenance records are maintained according to regulatory, organisational and manufacturer requirements
- 3 Maintain marine electrical motors**
- 3.1 Safety requirements associated with working on marine electrical motors are complied with
 - 3.2 Equipment required for maintenance of electrical motors is selected and checked for serviceability
 - 3.3 Routine maintenance procedures are applied on marine electrical motors according to regulatory, organisational and manufacturer requirements
- 4 Test marine electrical motor starters**
- 4.1 Safety requirements associated with working on marine electrical motor starters are complied with
 - 4.2 Faults in electrical motor starters are detected and rectified according to regulatory, organisational and manufacturer requirements
 - 4.3 Starting and running current load testing is performed on electrical motors according to regulatory, organisational and manufacturer requirements
 - 4.4 Procedures for finding start and finish of electrical motor windings are applied according to regulatory, organisational and manufacturer requirements

- 4.5 Testing and maintenance records are maintained according to regulatory, organisational and manufacturer requirements
- 5 Maintain marine electrical distribution systems**
- 5.1 Safety requirements associated with working on marine electrical distribution systems are complied with
- 5.2 Causes and potential dangers associated with earth faults in multi earth neutral and floating neutral systems are identified
- 5.3 Earth faults are detected and repaired using correct equipment according to regulatory, organisational and manufacturer requirements
- 5.4 Hazards associated with working on fluorescent lamp circuits are identified
- 5.5 Fluorescent lamp circuit is constructed using appropriate manuals and drawings according to regulatory, organisational and manufacturer requirements
- 5.6 Components, function and operation of watertight and flame proof fittings are identified
- 5.7 Reasons for earthing high voltage systems via a resistor are outlined
- 5.8 Routine maintenance, inspection and testing of marine electrical distribution systems is performed according to regulatory, organisational and manufacturer requirements
- 5.9 Temporary repairs to insulation are performed according to regulatory, organisational and manufacturer requirements
- 5.10 Limitation of temporary repairs to insulation in terms of survey requirements are identified
- 6 Maintain DC electrical systems**
- 6.1 Safety requirements associated with working on marine DC electrical systems are complied with
- 6.2 Operation of a rectifier is identified
- 6.3 Single-phase full wave rectifier fitted with filters is built and operated
- 6.4 Routine battery maintenance is carried out according to organisational and manufacturer requirements
- 6.5 Correct procedures for checking specific gravity of electrolyte in lead acid and alkaline batteries are applied

		according to manufacturer requirements
	6.6	Methods for supplying back up power for remote/automatic control equipment are identified
	6.7	Procedure for testing back up power is identified and applied
7 Identify faults in automated control systems	7.1	Pneumatic, hydraulic, electronic/electrical control systems are compared and contrasted
	7.2	Function and operation of main components of automated control systems is outlined
	7.3	Faults in automated control systems are detected and rectified using standard fault finding procedures
	7.4	Testing procedures for identifying function and performance of automatic control systems in vessel operating systems are identified and applied
8 Operate electrical testing and measuring equipment	8.1	Insulation tester is operated safely according to manufacturer procedures
	8.2	Continuity testing on electrical circuits is performed according to organisational and manufacturer procedures
	8.3	Clamp meter is operated safely according to manufacturer procedures
	8.4	Multimeter is operated safely according to manufacturer procedures
9 Test automatic control devices	9.1	Operational functions are performed on a monitor
	9.2	Different types and operation of control valves are identified
	9.3	Control system control functions are applied using different control devices

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.

Testing of marine generators include one or more of the following:	• functional test of automatic voltage regulator (AVR) • insulation • reading of alternator: • excitation circuit • stator

Faults in circuit breakers include one or more of the following:	• alignment of contactors • condition of: • closing and opening mechanisms • insulation barriers • wear and tear on linkages

Faults in electrical motor starters include one or more of the following:	• earthing • open circuit

Main components of automated control systems include one or more of the following:	• actuator • control valve • controller • positioner • regulator • relay • sensor • servomotor • transducer

Faults in automated control systems include	• failure of components • intermittent functional faults

one or more of the following:

Vessel operating systems include one or more of the following:

- auxiliary machinery
- boilers
- main engine
- power generation and distribution

Operation of control valves include one or more of the following:

- electrical
- hydraulic
- manual
- pneumatic

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB5001A Maintain and repair marine electrical and electronic equipment.

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 MARB013 Maintain and repair marine electrical and electronic equipment

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 on at least one occasion and include:

- applying relevant procedures
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- communicating procedures associated with maintaining and repairing marine electrical and electronic equipment verbally and in writing
- extracting information from basic electrical and electronic diagrams required to build electrical and electronic circuits
- identifying and interpreting numerical and graphical information in vessel electrical diagrams and specifications
- identifying and suggesting ways of rectifying faults and malfunctions in marine electrical and electronic systems on vessels
- identifying methods, procedures and materials needed for operating, maintaining and repairing marine electrical and electronic systems on vessels
- initiating timely action in response to defects or damage
- reading and interpreting written information related to operating and maintaining marine electrical and electronic systems, including specifications, drawings, technical manuals, and electrical and electronic circuit diagrams
- using testing equipment to gather information on function and performance of marine electrical and electronic systems.

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:

- alternating current (AC)/DC voltage
- batteries
- circuit breakers and interlocks fitted to circuit breakers
- circuits
- current protection relays:
 - operate on fault and request

- operate on fault and request and demand
- operate on fault and request and under voltage
- earthing
- electrical measuring and testing instruments
- electrical symbols, basic electrical and electronic diagrams and circuits
- fault protection equipment:
 - differential protection device
 - fuses
 - over voltage devices
 - over current devices
 - reverse power devices
 - thermal overload devices
 - thermistor protection devices
 - under voltage devices
- function and performance testing of system monitoring devices including:
 - alarm printer
 - data logger
- nature and causes of typical start up and shut down malfunctions of main and auxiliary electrical and associated systems and available methods for their detection and rectification
- operation of:
 - boiler, purifier and generator shut down systems
 - main engine shut down protective devices
 - protective devices found on board vessels
- operational characteristics and performance specifications for different types of electrical and electronic systems found on vessels
- principles and procedures of electrical maintenance
- purpose and content of safety data sheets (SDS)/material safety data sheets (MSDS)
- relevant procedures such as those relating to:
 - adjusting, testing and maintaining fault protection devices on switchboards
 - carrying out start up and shut down of electrical machinery and associated systems to ensure compliance with company and survey requirements and regulations
 - changing alarm-setting values in monitoring systems
 - confirming the accuracy of measuring monitoring
 - detecting electrical malfunctions and preventing damage
 - electrical safety and isolation
 - fault finding
 - marine maintenance, including difference between breakdown repair, planned maintenance and condition monitoring; purpose of maintenance recording and reporting procedures

- routine maintenance on marine electrical motors (cleaning inspection, deterioration of insulation, removal of dust and oil, renew of bearings)
- safety and emergency
- testing function and performance of protection devices as part of vessel statutory survey
- risks and safety procedures associated with working in high voltage environments
- safety, environmental and hazard control precautions and procedures relevant to start up and shut down of marine electrical machinery and associated systems
- safety requirements associated with working on marine electrical systems, including:
 - dangers associated with the spaces in the vicinity of busbars
 - potential dangers associated with instrument voltage/current transformer circuits
 - protection normally provided on doors of switchboard cubicles
- types of electrical and electronic equipment and components
- vessel safety management systems
- work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- working safely with electricity:
 - appropriate method of removing an electric shock victim from a live electrical situation
 - common causes of electrical accidents
 - effects of electric shock on the human body
 - electrical safe working practices
 - need for ensuring safe isolation of an electrical supply
 - precautions that can minimise chance of electric shock.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARB014 Maintain and repair shipboard machinery and equipment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to maintain and repair shipboard machinery and equipment on a vessel. This includes maintaining marine pumps, valves, air compressors, heat exchangers, diesel engines, turbochargers, marine lubricating systems and deck machinery as well as conducting inspections of marine boilers and marine refrigeration units.

This unit applies to the work of a Marine Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

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 Follow safe work practices

- 1.1 Work health and safety (WHS)/occupational health and safety (OHS) procedures relevant to maintaining shipboard machinery and equipment are complied with
- 1.2 Safety hazards are identified and reported according to safety

and vessel procedures

1.3 Prior to use, tools, equipment and testing devices needed to carry out maintenance activities for correct operation and safety are checked according to safety and vessel procedures

1.4 Before commencing maintenance activities, isolation precautions are implemented according to safety and vessel procedures

2 Maintain marine pumps

2.1 Maintenance requirements for pump are determined according to safety, manufacturer and vessel procedures and documentation

2.2 Appropriate procedures, materials, tools and equipment for maintaining pump are selected according to safety, manufacturer and vessel procedures

2.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities

2.4 Pump is disassembled, inspected and serviced according to safety, manufacturer and vessel procedures

2.5 Pump is reassembled and tested according to safety, manufacturer and vessel procedures

2.6 Performance of pump is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures

3 Maintain valves

3.1 Maintenance requirements for valve are determined according to safety, manufacturer and vessel procedures and documentation

3.2 Appropriate procedures, materials, tools and equipment for maintaining valve are selected according to safety, manufacturer and vessel procedures

3.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities

3.4 Valves are removed for maintenance according to safety, manufacturer and vessel procedures and documentation

3.5 Valve is disassembled and valve maintenance is performed according to safety, manufacturer and vessel procedures and

- documentation
- 3.6 Valves are reassembled and tested according to safety, manufacturer and vessel procedures and documentation
- 4 Maintain air compressors**
- 4.1 Maintenance requirements for air compressor are determined according to safety, manufacturer and vessel procedures and documentation
- 4.2 Appropriate procedures, materials, tools and equipment for maintaining air compressor are selected according to safety, manufacturer and vessel procedures
- 4.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
- 4.4 Air compressor is disassembled and inspected according to safety, manufacturer and vessel procedures
- 4.5 Air compressor is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
- 4.6 Performance of air compressor is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
- 5 Maintain heat exchangers**
- 5.1 Maintenance requirements for heat exchanger are determined according to safety, manufacturer and vessel procedures and documentation
- 5.2 Appropriate procedures, materials, tools and equipment for maintaining heat exchanger are selected according to safety, manufacturer and vessel procedures
- 5.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
- 5.4 Heat exchanger is disassembled and inspected according to safety, manufacturer and vessel procedures
- 5.5 Heat exchanger is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
- 5.6 Performance of heat exchanger is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
- 6 Maintain diesel**
- 6.1 Maintenance requirements for diesel engine are determined

engines	according to safety, manufacturer and vessel procedures and documentation
6.2	Appropriate procedures, materials, tools, measuring instruments and equipment for maintaining diesel engine are selected according to safety, manufacturer and vessel procedures
6.3	Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
6.4	Diesel engine components are disassembled and inspected for wear and deterioration according to safety, manufacturer and vessel procedures
6.5	Routine maintenance on diesel engines is performed according to manufacturer and vessel procedures
6.6	Diesel engine components are refurbished, as required, according to manufacturer and vessel procedures
6.7	Specialised tools and measuring instruments are used to maintain and refurbish diesel engines/components according to safety, manufacturer and vessel procedures
6.8	Diesel engine is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
6.9	Performance of diesel engine is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
7 Maintain turbochargers	7.1 Maintenance requirements for turbocharger are determined according to safety, manufacturer and vessel procedures and documentation
7.2	Appropriate procedures, materials, tools and equipment for maintaining turbocharger are selected according to safety, manufacturer and vessel procedures
7.3	Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
7.4	All components of turbocharger are disassembled and inspected for wear and deterioration according to safety, manufacturer and vessel procedures

	7.5	Turbocharger is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
	7.6	Performance of turbocharger is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
8 Inspect marine boilers	8.1	Inspection requirements for marine boiler are determined according to safety, manufacturer and vessel procedures and documentation
	8.2	Appropriate procedures for inspecting marine boiler are selected according to safety, manufacturer and vessel procedures
	8.3	Relevant information is extracted from drawings and technical specifications required to perform inspection activities
	8.4	Marine boiler is inspected for repair or general maintenance according to safety, manufacturer and vessel procedures
	8.5	Performance of marine boiler is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
9 Inspect marine refrigeration units	9.1	Inspection requirements for marine refrigeration unit are determined according to safety, manufacturer and vessel procedures and documentation
	9.2	Appropriate procedures for inspecting marine refrigeration unit are selected according to safety, manufacturer and vessel procedures
	9.3	Relevant information is extracted from drawings and technical specifications required to perform inspection activities
	9.4	Marine refrigeration unit is inspected for repair or general maintenance according to safety, manufacturer and vessel procedures
	9.5	Performance of marine refrigeration unit is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
10 Maintain marine lubricating systems	10.1	Inspection and maintenance requirements for lubricating systems are determined according to safety, manufacturer and vessel procedures and documentation

- 10.2 Relevant information is extracted from drawings and technical specifications required to perform inspection and maintenance activities
 - 10.3 Purifier maintenance procedures are applied according to safety, manufacturer and vessel procedures
 - 10.4 Components of lubricating system are inspected according to safety, manufacturer and vessel procedures
- 11 Maintain and repair deck machinery**
- 11.1 Maintenance and/or repair requirements for deck machinery are determined according to safety, manufacturer and vessel procedures and documentation
 - 11.2 Appropriate procedures, materials, tools and equipment for maintaining and/or repairing deck machinery are selected according to safety, manufacturer and vessel procedures
 - 11.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
 - 11.4 Deck machinery maintenance and/or repair procedures are implemented according to safety, manufacturer and vessel procedures
 - 11.5 Deck machinery is tested and adjusted according to safety, manufacturer and vessel procedures
 - 11.6 Performance of deck machinery is confirmed against recommended performance specifications according to safety, manufacturer and vessel 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.

Pumps include one or more of the following:	• axial • centrifugal • gear • reciprocating • screw
Serviced includes one or more of the following:	• dismantling rod and gears, seals, bearings and relief valve • identifying wear and deterioration • measuring wear in cylinders, neck rings and rods • protecting finished surfaces • removing: • gland packing • studs, intact and broken • replacing and adjusting seals
Valves include one or more of the following:	• ball • butterfly • check • diaphragm • gate • globe: • screw down non return • screw lift
Valve maintenance include one or more of the following :	• examining seats, valves, spindles and glands • gland packing: • selection • removal • repacking • lapping valves and seats • machining valves and seats
Air compressor is	• coolers and cooling passages

disassembled and inspected include one or more of the following:

- lubricating systems
- piston and rings
- suction and delivery valves and seats

Heat exchanger is disassembled and inspected include one or more of the following:

- corrosion
- erosion
- fouling
- leakage
- provision for tube expansion

Diesel engine components are disassembled and inspected include one or more of the following:

- bearings
- cooling system
- crankshaft alignment
- liners
- lubrication system
- pistons
- rings
- valves

Routine maintenance on diesel engines include one or more of the following:

- air intake system:
 - inspecting and changing air filters
 - inspecting turbocharger to make sure there is no fouling of compressor blades from crankcase gases
- cooling system
 - fluid level checks
 - coolant sampling for trending analysis
 - draining, flushing and refilling system when required
- emissions systems:
 - inspecting crankcase ventilation systems, selective catalytic reduction (SCR) systems and diesel particulate filters (if so equipped)
- exhaust system:
 - inspecting for leaks, corrosion, wet stacking
- fuel system:
 - changing fuel filters, fuel injectors
 - checking water separators
- lubrication:
 - checking levels
 - changing oil, oil filters

- taking oil samples for trending analysis to optimise oil change intervals and to detect engine wear
- mechanical systems:
 - inspecting resilient engine mounts and torsional couplings
 - generally inspecting for leaks, wear or deterioration
- operating systems:
 - downloading data from digital engine management system to note and review alarm conditions
- valves and heads:
 - inspecting, adjusting and recording valve train wear for trending analysis
 - inspecting and recording cylinder head wear for trending analysis

Diesel engine components are refurbished include one or more of the following:

- air start valves
- cylinder heads
- exhaust valves
- fuel injectors
- relief valves

Components of turbocharger include one or more of the following:

- air casing
- air filters
- bearings
- diffuser
- gas inlet grid
- impeller
- inducer
- nozzle ring
- rotor
- volute

Inspection requirements for marine boiler include one or more of the following:

- fire side
- water side

Inspection requirements for marine refrigeration unit include one or more

- compressors
- condensers
- evaporators

of the following:

- expansion valves
- oil separators

Components of lubricating system include one or more of the following:

- settling tank
- system bearings
- system filters

Deck machinery includes one or more of the following:

- cranes
- lifeboat davits and gear
- mooring winch
- winch
- windlass

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB5002A Maintain and repair shipboard machinery and equipment.

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 MARB014 Maintain and repair shipboard machinery and equipment

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 on at least one occasion and include:

- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining principles of shipboard machinery and equipment and imparting knowledge and ideas verbally and in writing
- initiating timely action in response to defects or damage
- performing calculations and interpreting graphical information used in maintaining shipboard machinery and equipment
- reading and interpreting written information related to the operation, performance and maintenance of shipboard machinery and equipment, including machinery specifications and operational manuals
- scheduling maintenance of shipboard machinery and equipment
- using testing equipment and explaining test and performance results relevant to shipboard machinery and equipment.

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:

- basic principles of diesel engine operation including:
 - typical starting air and manoeuvring systems of diesel engines, including all components normally found therein
 - typical diesel engine lubrication systems, including:
 - operating principles and adjustments of diesel engine fuel injection equipment, including common service faults, symptoms and causes of diesel fuel injection problems, explaining appropriate actions to be taken
 - means of pressure charging diesel engines, including common service faults, appropriate actions to rectify these faults, and emergency operation and isolation procedures
 - different methods of cooling marine diesel engines, including common requirements of cooling
 - common faults and appropriate action to be taken with cooling of diesel engines

- causes of crankcase and air-line explosions, and scavenge and uptake fires
- materials used to construct following diesel engine major parts:
 - crank shafts
 - cylinder liners and heads
 - exhaust valves
- basic principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, fault finding and repair of faults in electrical and electronic equipment, including:
 - basic electrical circuit theory
 - basic theory of electromagnetism and electrostatics
 - electrolytic action and cells
 - AC and DC theory and plant and equipment
 - basic cabling, distribution and lighting systems
 - basic control and switch gear
 - instruments, calibration and testing
- basic principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery
- basic principles of operating and maintaining:
 - fluid power control systems
 - refrigeration systems
 - machinery lubrication systems
 - marine boilers and materials used to construct following boiler major parts:
 - water tubes
 - furnace
 - steam and water drum
 - superheaters
- basic thermodynamics, including:
 - basic thermodynamic properties of common working fluids
 - methods of heat transfer and related problems
 - principles of heat transfer by conduction, convection and radiation and their application to marine systems
 - elementary principles of steam plants
 - basic steam plant cycles and function of each component
 - combustion process and calorific value of fuels
 - air/fuel ratio and significance of excess air on combustion
 - operating cycle of single stage reciprocating air-conditioners, including methods for the mass of air delivered
 - clearance volume, its effect on volumetric efficiency and methods of calculating volumetric efficiency
 - advantages of multi-staging and inter-cooling
 - meaning of gauge and absolute pressure

- temperature and temperature scales
- system international (SI) units and common thermodynamic terms and principles
- maintenance and repair hazards and problems, and appropriate preventative and remedial action and solutions during maintaining and repairing shipboard plant and equipment
- maritime communication techniques needed during maintenance and repair operations
- materials used to construct the following gas turbine major parts:
 - turbine casing
 - rotors
 - compressors
 - gas generators
- materials used to construct the following steam turbine major parts:
 - turbine casings
 - rotors
 - blades
 - nozzles
 - reduction gears
- national and international regulations, International Maritime Organization (IMO) Conventions and Codes, including Australian Maritime Safety Authority (AMSA) Marine Orders applicable to managing shipboard plant and equipment maintenance and repair operations
- nature and causes of typical shipboard plant and equipment malfunctions and available methods for their detection and repair, including established fault finding techniques
- operating principles and performance specifications for different types of shipboard plant and equipment usually found on a vessel of unlimited propulsion power
- operating principles of unmanned machinery spaces (UMS) and automated monitoring and control of machinery
- planned maintenance systems and procedures for condition monitoring of plant and equipment, including responsibilities and requirements covered by various forms of vessel survey
- plant and equipment typically found on board a vessel of unlimited propulsion power
- procedures for:
 - carrying out shipboard plant and equipment fault finding and repair as part of routine maintenance procedures to ensure compliance with company and survey requirements, and established safety rules and regulations
 - completing temporary and permanent repair and/or replacement procedures for plant and equipment on board vessels at sea, alongside and in dry dock
 - reading and interpreting plant and equipment performance readings and instrumentation
- purpose and content of safety data sheets (SDS)/material safety data sheets (MSDS)
- safe procedures for:
 - handling heavy plant, equipment and component parts during maintenance and repair of shipboard plant and equipment
 - using hand and power tools and maintenance equipment

- safety, environmental and hazard control precautions and procedures relevant to shipboard plant and equipment inspection and maintenance operations
- types of vessel maintenance and repair records to be maintained to meet requirements of company, survey and regulatory authorities
- typical vessel and plant and equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagrams
- work health and safety (WHS)/occupational health and safety (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 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC001 Complete engine room tasks

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform tasks to support the operation of marine internal combustion engines, marine propulsion systems, vessel machinery and auxiliary systems.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 3 Near Coastal on vessels up to 500 kW or as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment Operations

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 tasks

- 1.1 Work plan is developed and sequenced in conjunction with others involved in or affected by plan, according to organisational procedures
- 1.2 Timelines, jobs and work priorities are confirmed with Master and other relevant authorities, when applicable

2 Conduct refuelling operations	2.1	Tank levels are correctly measured and reported pre and post fuelling operations
	2.2	Fuel capacity is calculated
	2.3	Tools and equipment are selected and checked for serviceability
	2.4	Safety boundary and signage for refuelling operation are accessed and used
	2.5	Fire and spill prevention systems are correctly deployed
	2.6	All personal protective equipment is accessed and used
	2.7	Refuelling operations are performed safely and effective communication is maintained with relevant personnel to ensure safety and integrity of vessel and crew
	2.8	Appropriate action is taken to handle incidents arising during fuelling operations according to organisational procedures and regulatory requirements
3 Maintain stock and consumables	3.1	Stock levels and consumables are monitored and maintained at required levels
	3.2	Stock and consumables are reordered as required
	3.3	Records of stock inventories and consumables are maintained and discrepancies are identified
4 Perform general housekeeping tasks	4.1	Housekeeping tasks are clarified against work plan
	4.2	Appropriate equipment for specific tasks is determined, prepared and used
	4.3	Housekeeping tasks are performed and assessed against task requirements
	4.4	Procedures for handling, storing and disposing of cleaning liquids are implemented according to regulatory requirements
5 Stow and manage flammable and explosive materials	5.1	Hazards related to flammable and explosive materials are identified
	5.2	Suitability of stowage areas is verified against regulatory requirements and organisational procedures
	5.3	Procedures for safe handling and stowage of flammable and

		explosive materials are implemented according to regulatory requirements and organisational practices
6 Prepare simple reports	6.1	Requirements for simple reports are identified
	6.2	Information is prepared according to organisational procedures
	6.3	Calculations for fuel consumption and voyage duration are completed
	6.4	Information is assessed for accuracy, currency and relevance for inclusion in report
	6.5	Report is written using appropriate terminology

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.

Tools and equipment include one or more of the following:	• bunding • firefighting equipment • personal protective clothing and equipment • scupper plugs • signage • spill kit

Incidents include one or	• fire

more of the following::

- spillage on board
- spillage over the side

Stock and consumables
include one or more of the
following:

- anodes
- batteries
- cleaning material and equipment
- filters
- fuel
- lubricants
- paint
- spare parts
- water

Housekeeping tasks
include one or more of the
following:

- correct disposal of waste
- correct storage of:
 - equipment
 - chemicals
- general cleaning
- pumping of bilges
- removal or lashing of loose items

Flammable and explosive
materials include one or
more of the following:

- battery generated gases
- chemicals
- fuels
- liquefied petroleum gas (LPG)
- lubricating oils
- oil soaked rags (spontaneous combustion)

Simple reports include one
or more of the following:

- breakdown reports
- maintenance logs
- repair requests and reports
- running logs

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2001A Complete engine room tasks.

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 MARC001 Complete engine room tasks

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 on at least one occasion and include:

- assessing information and data for relevance
- completing all work to specification
- conducting refuelling
- converting:
 - units to multiples of base units
 - fractions to decimals
- keeping running and maintenance logs
- performing calculations involving:
 - volume and capacity of regular shaped tanks
 - consumption of fuel and lubricating oil, hourly fuel consumption, theoretical steaming times and distances
- performing calculations to determine the area of a circle
- sequencing tasks
- using relative density/specific gravity to convert quantity in litres and volume to mass
- writing simple reports.

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:

- common SI units such as kilogram, tonne, litre and metre
- identification of hazardous goods
- principles of simple report writing
- procedures and requirements for cleaning and housekeeping
- safety data sheets (SDS)/material safety data sheets (MSDS)
- work health and safety (WHS)/occupational health and safety (OHS) practices, including hazard identification, risk assessment and risk control options.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC002 Maintain hull out of water

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to carry out basic maintenance to vessel hull while it is out of water.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 3 Near Coastal on vessels up to 500 kW or as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare for work

1.1	Planned maintenance program for hull type and construction material is accessed to determine hull maintenance requirements
1.2	Vessel is inspected and additional maintenance requirements are determined

	1.3	Maintenance tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work
	1.4	Repair tools and equipment are selected and checked for serviceability
	1.5	Work area is prepared
2 Carry out required maintenance and repairs to hull, equipment and fittings	2.1	Suitable personal protective equipment is selected and used according to work health and safety (WHS)/occupational health and safety (OHS) requirements
	2.2	Permits for hot work, confined space entry and other high risk activities are completed according to organisational and regulatory requirements
	2.3	Tasks are performed according to manufacturer specifications, maintenance yard requirements and organisational practices
3 Clean up and complete documentation	3.1	Work area is cleared and cleaned so it is in a serviceable condition
	3.2	Materials are disposed of or recycled according to legislative and organisational requirements
	3.3	Tools and equipment are cleaned, checked and stored according to organisational procedures
	3.4	Maintenance report is completed according to workplace 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.

Maintenance tasks include one or more of the following:

- examining anchors and cables
- inspecting and repairing:
 - hull fittings
 - stern drive and jet drive systems
 - watertight and weather tight hatches
- inspecting and replacing anodes
- withdrawing and examining:
 - propeller, shafts and seals
 - rudder, rudder stock and seals

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2002A Maintain hull out of water.

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 MARC002 Maintain hull out of water

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 on at least one occasion and include:

- ensuring work is carried out to regulatory requirements for issue or endorsement of relevant certificates
- explaining procedures and techniques for hull maintenance according to regulations and vessel operating procedures
- implementing safe and environmentally responsible work practices
- planning and preparing for maintenance including systematic isolation, dismantling and reassembly of parts
- reading, interpreting and applying:
 - manufacturer instructions including all WHS/OHS requirements and safety data sheets (SDS)/material safety data sheets (MSDS)
 - operating and service manuals for maintenance of vessel hull
- recognising:
 - faulty equipment
 - hull damage and deterioration
 - and taking appropriate action according to organisational procedures
- selecting and using correct tools and equipment for maintenance task.

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:

- component parts, operation and routine maintenance requirements of vessel, equipment and fittings
- differences in vessels, hull structures and equipment
- functions of underwater equipment
- hazards of working in confined spaces
- hull maintenance
- maintenance hazards and problems
- nature and causes of corrosion of marine surfaces and structures, and available methods for its control

- organisational procedures for maintenance
- principles and procedures of lubrication as they relate to underwater vessel equipment and fittings
- procedures for:
 - checking and inspecting vessel hull as part of routine maintenance program
 - initiating and coordinating repair and/or replacement of underwater equipment and fittings
- relevant WHS/OHS legislation
- types, characteristics and functions of equipment/tools used in maintenance
- use of sacrificial anodes.

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 including:
 - hand and power tools
 - ladders
 - specialised tools
 - cleaning chemicals
 - lubricants
 - rags
 - rust treatments
 - spare parts
 - spent oils and grease
 - used components
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC003 Operate and maintain extra low and low voltage electrical systems and equipment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate, test and maintain extra low and low voltage electrical systems and equipment.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 3 Near Coastal on vessels up to 500 kW or as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

WARNING: Relevant state/territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Operate electrical systems and

1.1 Routine pre-operational checks are carried out on electrical systems and equipment according to manufacturer

equipment	specifications
2 Carry out routine maintenance on electrical systems and equipment	1.2 Systems and equipment are operated according to manufacturer specifications
	1.3 Faults are identified and appropriate action is taken to rectify them
	1.4 Faults are reported and logged promptly and accurately to appropriate personnel
	2.1 Tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work
	2.2 Tools and equipment are selected and checked for serviceability
	2.3 Components to be maintained are isolated
	2.4 Systems are tested and test results are compared with manufacturer specifications
	2.5 Maintenance tasks are carried out to specification
	2.6 Unserviceable components are tagged according to organisational procedures and appropriate personnel are notified
3 Isolate faulty components for repair	3.1 Faulty items or components are isolated according to workplace procedures
	3.2 Serviceable items are fitted according to manufacturer specifications
	3.3 Operational check is carried out on equipment or system to ensure its compliance with manufacturer specification
4 Clean up and complete documentation	4.1 Work area is cleared and cleaned
	4.2 Materials are disposed of or recycled according to legislative and workplace requirements
	4.3 Tools and equipment are cleaned, checked and stored according to workplace procedures
	4.4 Maintenance report is completed according to workplace 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.

Electrical systems and equipment include one or more of the following:

- alternators
- batteries
- charging systems
- fuses and circuit breakers
- generators
- motors
- shore power connection
- starter motors

Faults include one or more of the following:

- battery faults
- failure of alternators to produce voltage
- failure of starter motors
- faults with shore power connections including phase rotations
- operation of fuses and circuit breakers

Maintenance tasks include one or more of the following:

- replacing fuses
- testing batteries, voltage, electrolyte and rectifying faults
- testing charging system voltage output

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2003A Operate and maintain extra low and low voltage electrical systems and equipment.

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 MARC003 Operate and maintain extra low and low voltage electrical systems and equipment

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 on at least one occasion and include:

- applying safety requirements throughout the work sequence including the use of personal protective equipment
- completing all work to specification
- ensuring correct requirements and details of basic maintenance of electrical systems and equipment are available
- implementing safe and environmentally responsible work practices in testing and maintenance activities
- initiating timely action in response to defects or damage
- locating, interpreting and applying manufacturer specifications for electrical systems and equipment
- operating direct current (DC) systems and conducting operator preventive maintenance according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- operating electrical systems according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- recognising electrical system faults and where necessary taking steps to make them immediately safe
- selecting and using appropriate processes, tools and equipment.

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:

- basic care and fault recognition of electrical systems and equipment
- batteries:
 - care and maintenance
 - hazards
 - types
- charging systems:
 - alarms/indicators

- regulators
- connecting batteries
- DC systems not exceeding 32 V DC
- electrical systems:
 - above 32 V DC and up to 415 V alternating current (AC)
- fault identification, location and safety implications
- personal safety
- protective devices on switchboards
- relevant state/territory training and qualification requirements for carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work
- shore power connection
- starter motors, alternators and associated equipment:
 - operation
 - maintenance
- uses of fuses and circuit breakers – selection of correct capacity
- 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 including:
 - hand and power tools
 - test equipment
 - distilled water
 - rags
 - used components
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals

- range of relevant exercises, case studies and/or simulations.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC004 Operate deck machinery

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to safely use deck machinery on a vessel.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 3 Near Coastal on vessels up to 500 kW or as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare lifting equipment and deck machinery for use

1.1	Appropriate personal protective equipment and machinery is selected, used and stored according to work health and safety (WHS)/occupational health and safety (OHS) requirements
1.2	Routine pre-operational checks are carried out on lifting equipment and deck machinery according to manufacturer specifications, regulatory and organisational requirements

	1.3	Deviations from the norm are promptly identified and rectified
	1.4	Adjustments are made to achieve a safe and efficient operation
	1.5	Inability to start machinery is reported promptly and accurately to appropriate personnel
2 Operate lifting equipment and deck machinery	2.1	Machinery is operated in a safe and controlled manner
	2.2	Machinery is operated within defined operating limits when running, to achieve optimum safety and efficiency
	2.3	Deviations from normal operations are promptly identified
	2.4	Action is taken to rectify basic operational faults to maintain optimum safety and efficiency
	2.5	Appropriate action is taken in a malfunction or emergency
3 Check and complete lifting equipment and deck machinery operations	3.1	Equipment and machinery shut-down procedures are carried out according to manufacturer specifications and organisational procedures
	3.2	Equipment and machinery damage, malfunctions or irregular performance is recorded and reported 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.

Pre-operational checks include one or more of the following:

- inspecting safety guards, power take off stubs and shafts
- lifting equipment
- observing and monitoring noise levels for correct operation
- pre-start and safety checks including:
 - oils and lubricants
 - lines
- emergency stops

Lifting equipment and deck machinery include one or more of the following:

- basic hydraulic systems
- capstans
- cranes
- trawling and fishing gear
- winches
- windlasses

Safe and controlled manner includes one or more of the following:

- maintaining workloads within specifications
- selecting and using appropriate machinery and equipment
- using operational techniques for specific location and weather conditions

Basic operational faults include one or more of the following:

- failure of hydraulic lines
- machinery break downs
- structural failure

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2004A Operate deck machinery.

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 MARC004 Operate deck machinery

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 on at least one occasion and include:

- following manufacturer recommendations, regulations and vessel operating procedures
- implementing safe work practices
- using deck machinery.

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:

- basic hydraulic systems and their operation
- legislation affecting lifting equipment
- lifting equipment
- own ability and limits to rectify irregularities and faults
- safe working procedures
- trawling and fishing gear
- winches, capstans, windlasses
- 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 currently used in industry
- personal protective equipment including:
 - boots
 - gloves
 - hard hat
 - hearing protection
 - overalls
 - protective eyewear
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC005 Operate inboard and outboard motors

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate inboard and outboard motors, and to diagnose basic faults.

This unit applies to deck and engine workers working in the maritime industry on vessels up to 12 metres. They could be working independently or as part a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment Operations

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 Operate inboard and outboard motors

- 1.1 Pre-start checks are performed on the motor
- 1.2 Fuel is checked to ensure there is adequate fuel, including a reserve, on board
- 1.3 Motor is started and stopped safely and correctly
- 1.4 Motor controls are used to manoeuvre the vessel safely to complete work tasks

	1.5	Motor is operated within safe limits during normal manoeuvres
2 Secure vessel on completion of work task	2.1	Vessel is moored safely
	2.2	Fuel system is closed down
	2.3	Vessel is secured
	2.4	Fuel is stored to minimise environmental and fire hazards where appropriate
	2.5	Unserviceable equipment is reported and tagged out as unserviceable
3 Maintain inboard and outboard motors	3.1	Fuel filters are drained of excess water
	3.2	Batteries and connections are maintained to ensure reliable electrical supply to the motor
	3.3	Engine and gearbox oil is checked and lubrication is applied
	3.4	Engine mounting gear is checked as necessary
4 Identify basic inboard and outboard motor faults	4.1	Operating difficulties caused by fuel-related factors are identified
	4.2	Electrical faults are identified, tagged out and reported
	4.3	Motor propulsion faults are identified, tagged out and reported

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.

Pre-start checks must include:

- amount of fuel in the fuel tank
- appropriate fuel and oil
- cooling water intake submerged
- fuel hose connected, full and free of restrictions
- fuel tank depressurised
- motor attachment points
- water depth

Starting a motor includes one of the following:

- electric start
- pull start

Propulsion faults include one or more of the following:

- bent or broken propeller
- broken shear pin or drive spline
- fouling
- spark plugs

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2005A Operate inboard and outboard motors.

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 MARC005 Operate inboard and outboard motors

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 on at least one occasion and include:

- berthing a vessel
- conducting pre-start, running and shut down checks on inboard and outboard motors, and tagging out and reporting faults
- estimating fuel consumption
- manoeuvring to maintain a steady course
- reading and interpreting company standard operating procedures (SOPs) about operating inboard and outboard engines
- using inboard and outboard motor steering system
- working safely at all times.

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:

- battery connection and hazards
- International Convention for the Prevention of Pollution from Ships (MARPOL) requirements
- motor:
 - cooling systems
 - fuel systems
 - lubricating systems
- risks associated with:
 - portable fuel tanks
 - transport by road of fuel and oil in trailer boats
- standard procedures to tag out and report faults
- storing an outboard motor
- transport by road of fuel and oil in trailer boats
- troubleshooting techniques
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC006 Operate main propulsion unit and auxiliary systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to safely operate the main propulsion unit and auxiliary systems on a vessel up to 12 metres with a propulsion power:

- for an inboard engine < 500 kW
- for an outboard engine of unlimited power.

This unit applies to deck and engine workers working in the maritime industry on vessels up to 12 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment Operations

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 Prepare propulsion unit and auxiliary system for use

1.1 Appropriate personal protective clothing and equipment is selected, used, maintained and stored according to work health and safety (WHS)/occupational health and safety (OHS) requirements

1.2 Routine pre-operational checks are carried out on equipment according to manufacturer specifications and workplace

- requirements
- 1.3 Deviations from the norm are promptly identified and rectified
 - 1.4 Adjustments are made to achieve a safe and efficient operation
 - 1.5 Inability to start up equipment is reported promptly and accurately to appropriate personnel
- 2 Operate propulsion unit and auxiliary system**
- 2.1 Equipment is operated in a safe and controlled manner
 - 2.2 Performance and efficiency of equipment is monitored according to manufacturer instructions
 - 2.3 Equipment is maintained within defined operating limits when running, to achieve optimum safety and efficiency
 - 2.4 Environmental implications associated with operating equipment are identified and controlled
 - 2.5 Deviations from normal operations are promptly identified
 - 2.6 Action is taken to rectify irregularities to maintain optimum safety and efficiency
- 3 Check and complete propulsion unit and auxiliary system operation**
- 3.1 Equipment shut-down procedures are carried out according to manufacturer specifications and workplace procedures
 - 3.2 Equipment operational records are maintained according to workplace procedures
 - 3.3 Equipment damage, malfunctions or irregular performance are recorded and reported according to workplace procedures
 - 3.4 Equipment is cleaned according to manufacturer specifications and workplace 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.

Personal protective clothing and equipment include one or more of the following:

- boots
- gloves
- hard hat
- hearing protection
- overalls
- protective eyewear
- respirator or facemask

Pre-operational checks include one or more of the following:

- checking and confirming equipment calibration settings
- inspecting safety guards, power take off stubs and shafts
- observing and monitoring noise levels for correct operation
- pre-start and safety checks including:
 - oils and lubricants
 - fuel systems
 - leads
 - lines
 - connections

Equipment must include:

- auxiliary equipment
- bilge systems
- cooling, lubricating and fuel systems
- drive train assembly
- fire pumping arrangements
- low voltage electrical systems
- monitoring machinery
- petrol, diesel and outboard engines
- shore power leads and connections
- steering gear
- two- and four-stroke engines

Safe and controlled manner include one or more of the following:

- appropriate selection and use of machinery and equipment
- maintaining workloads within specifications
- using operational techniques for the specific location and weather conditions

Environmental implications include one or more of the following:

- excessive noise and exhaust emissions
- incorrect use of maintenance debris for example oils, containers, chemical residues
- hazardous substances

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2006A Operate main propulsion unit and auxiliary systems.

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 MARC006 Operate main propulsion unit and auxiliary systems

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 on at least one occasion and include:

- implementing safe and environmentally responsible work practices
- measuring and calculating volumes, consumption and servicing requirements
- operating propulsion machinery and ancillary equipment to industry standards
- providing required amount of detail in reports
- recordkeeping.

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:

- environmental impacts and minimisation measures associated with operating propulsion machinery and auxiliary equipment
- environmental responsibilities
- factors associated with the safe operation of propelling and auxiliary equipment
- hazards of refrigerant gases
- identification of components
- manufacturer specifications for operating propulsion machinery and auxiliary equipment
- operating principles and operating methods for propulsion machinery and auxiliary equipment
- potential hazards and risks associated with operating propulsion machinery and auxiliary equipment
- potential hazards and risks involved with types of fuels for example petrol, diesel, liquefied petroleum gas (LPG)
- preparing for the use of propelling machinery, auxiliary equipment and other mechanical equipment
- routine checks required with the operation of propelling machinery, auxiliary equipment and other mechanical equipment
- shore power connections and associated hazards
- use of low voltage electrical systems

- what to do in the case of malfunctions and emergencies with propelling machinery, auxiliary equipment and other mechanical equipment
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC007 Operate marine internal combustion engines, and propulsion and auxiliary systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to safely operate marine internal combustion engines, and propulsion and auxiliary systems on a vessel.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 3 Near Coastal on vessels up to 500 kW or as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare engine, and propulsion and auxiliary systems for use

1.1	Appropriate personal protective equipment is selected, used, maintained and stored according to work health and safety (WHS)/occupational health and safety (OHS) requirements
1.2	Routine pre-operational checks are carried out on equipment according to manufacturer specifications and workplace

- requirements
- 1.3 Engine is started according to manufacturer specifications and organisational requirements
 - 1.4 Deviations from the norm are promptly identified and rectified
 - 1.5 Adjustments are made to achieve a safe and efficient operation
 - 1.6 Inability to start equipment is reported, and logged promptly and accurately to appropriate personnel
- 2 Operate engine, and propulsion and auxiliary systems**
- 2.1 Engine, and propulsion and auxiliary systems are operated in a safe and controlled manner
 - 2.2 Performance and efficiency of engine, and propulsion and auxiliary systems are monitored according manufacturer instructions
 - 2.3 Engine, and propulsion and auxiliary systems are operated within defined operating limits when running, to achieve optimum safety and efficiency
 - 2.4 Environmental implications associated with operation of engine, and propulsion and auxiliary systems are identified and controlled
 - 2.5 Deviations from normal operations are promptly identified
 - 2.6 Action is taken to identify and rectify basic operational faults to maintain optimum safety and efficiency
 - 2.7 Appropriate action is taken in the event of a malfunction or emergency
- 3 Complete operations**
- 3.1 Equipment shut-down procedures are carried out according to manufacturer specifications and workplace procedures
 - 3.2 Engine, propulsion and auxiliary system operational records are maintained according to workplace procedures
 - 3.3 Equipment damage, malfunctions or irregular performance is recorded and reported according to workplace 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.

- Pre-operational checks include one or more of the following:
- checking coolants levels
 - checking:
 - filters
 - fuel level
 - starting system
 - there is enough power available on switchboard and close isolator
 - confirming correct pressures of auxiliary systems
 - connections
 - dip oil
 - inspecting batteries and turning on isolator
 - inspecting for leaks and faults
 - inspecting safety guards, power take off stubs and shafts
 - leads
 - lines
 - opening valves as appropriate

- Equipment includes one or more of the following:
- auxiliary equipment and associated spaces
 - cooling systems
 - firefighting equipment
 - fuel systems
 - gearbox
 - lubricating systems
 - marine two- and four-stroke:

- diesel engines
- petrol engines
- propeller and immediate shafting alignment
- pumping systems
- refrigeration systems
- steering systems
- sterndrive and water jet drive units

Environmental implications must include:

- excessive noise and exhaust emissions
- loss of fuel and oil overside

Basic operational faults include one or more of the following:

- starting faults
- failure of:
 - cooling systems
 - fuel system
 - lubrication systems
- gearbox faults
- pumping systems failure
- refrigeration systems failure
- steering failure

Emergencies include one or more of the following:

- failure of main engine
- fire
- flooding
- loss of steering

Operational records include one or more of the following:

- maintenance logs
- running logs

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2007A Operate marine internal combustion engines, and propulsion and auxiliary systems.

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 MARC007 Operate marine internal combustion engines, and propulsion and auxiliary systems

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 on at least one occasion and include:

- arranging maintenance according to technical specifications
- checking pressures, temperatures and revolutions during start-up and warm-up periods according to technical specifications
- complying with vessel operating procedures and manufacturer recommendations for start-up and making available fuel, lubricants, cooling water and air
- identifying:
 - main difference between two- and four-stroke cycles of operation
 - major parts of marine internal combustion engines
 - marine propulsion systems components and explaining their functions
- implementing safe and environmentally responsible work practices
- initiating timely action in response to defects or damage
- managing fuel systems safely according to regulations, manufacturer instructions and vessel procedures, so as to prevent pollution of the marine environment
- operating:
 - lubricating systems according to established procedures and so as to prevent pollution of the marine environment
 - main propulsion plant auxiliary systems to ensure safe operating conditions
 - marine internal combustion engines within technical specifications
 - pumping systems according to manufacturer instructions, operational procedures and regulations to ensure safety of operation and prevention of pollution of the marine environment
 - refrigeration system according to manufacturer instructions, operational procedures and regulations to ensure safety of operation and prevention of pollution of the marine environment
- outlining operation and servicing propulsion system within the technical specifications
- preparing shut-down and supervising cooling down of engine according to vessel operating procedures and manufacturer recommendations
- reading and interpreting manufacturer specifications
- recognising and repairing basic operational faults or organising maintenance assistance

- testing steering arrangements according to manufacturer instructions, operational procedures and regulations.

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:

- air filters
- back-flooding prevention
- basic:
 - combustion process
 - governor operation
 - timing diagrams
- bearing types, materials, installation, lubrication
- causes of vibration and undue wear
- circulating pumps
- controllable pitch propellers
- cooling systems including keel cooling/heat exchangers, circulating pumps, ship's side valves, coolant circulation and thermostats
- corrosion
- couplings types, fittings, keys and keyways
- drive systems, belts, clutches, motors, etc. of pumping systems
- dual duty systems/cross connection
- emergency procedures
- engine watchkeeping
- fault identification, maintenance, prevention of corrosion
- fuel system fault-finding and possible emergency operation
- fuel systems including petrol/diesel, carburettors/fuel injectors, common rail
- gear box fault identification and emergency operation
- glands, packing, seals
- identification of components of refrigeration systems
- injection pumps
- inspection and checks of main and auxiliary machinery and associated spaces
- instrumentation
- keeping running and maintenance logs
- lubricating systems including lube oil circulating systems, lube oil system components, general lubrication, cooling effects and lubrication system problems
- main differences between two- and four-stroke cycles of operation
- maintenance and inspection
- marine two- and four-stroke:
 - diesel engines
 - petrol engines

- major parts of marine internal combustion engines
- operation of firefighting equipment in engine space
- own ability and limits to rectify irregularities
- power transmission operation
- propeller and intermediate shafting alignment
- pumping systems including fire/bilge/tank circulating systems
- refrigeration systems including hazards of refrigerant gases
- relevant environmental responsibilities, regulations and legislative requirements
- rudder and stock support bearings
- running checks
- shaft seals and glands, packings
- start-up and shut-down procedures
- steering operation of hydraulic, cable, rod and gear
- steering systems including rudder construction and rudder types
- sterndrive and water jet drive units
- strainers, mudboxes, foot valves
- testing of steering and hydraulic systems
- tiller arm attachment
- turbo/supercharging
- use of flexible materials, hoses
- valve types:
 - construction and routine servicing
- 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 including:
 - boots

- gloves
- hard hat
- hearing protection
- overalls
- protective eyewear
- respirator or face mask
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC008 Manage fuel systems

Modification History

Release 2. Range of Conditions updated to include relevant information.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage the fuel and fuel oil systems of a vessel to ensure safety of operation and to avoid pollution of the marine environment.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW or as a Marine Engine Driver Steam.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 refuelling

- 1.1 Fuel tanks are dipped to establish current level of fuel
- 1.2 Amount of fuel on board vessel is calculated and positioning of fuel is determined
- 1.3 Impact of refuelling on vessel safety is determined

	1.4	Fuel is ordered according to organisational procedures
2 Prepare vessel for refuelling	2.1	Vessel is positioned and secured for refuelling
	2.2	Refuelling equipment is correctly deployed according to organisational procedures
	2.3	Communication between all people involved in refuelling procedures is established
	2.4	Tank valves are opened as necessary and refuelling operations are performed according to organisational procedures and regulatory requirements
	2.5	Tanks are dipped to ensure correct amount of fuel has been received
3 Complete refuelling operations	3.1	Shut-down procedures are conducted according to organisational procedures
	3.2	Refuelling equipment is secured according to organisational procedures
	3.3	Refuelling records are completed according to organisational procedures and regulatory requirements
	3.4	Malfunctions, faults, irregular performance or damage to refuelling equipment are recorded according to organisational procedures
4 Manage an emergency	4.1	Appropriate response is made to emergency situation according to organisational procedures
	4.2	All personnel are correctly notified and their activities are managed to ensure their safety, according to organisational procedures
	4.3	Waste containment measures are implemented to protect the environment
	4.4	Appropriate authorities are notified when applicable
	4.5	Incident is recorded according to regulatory requirements and 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.

Impact of refuelling on vessel safety include one of the following:

- ignition of released fuel vapours
- loss of stability

Refuelling equipment include one or more of the following:

- bunding
- bunker flag (B Flag)
- firefighting equipment
- no smoking signs
- scupper plugs
- spill kit

Shut-down procedures include one or more of the following:

- communications with fuel supplier
- valve closure

Refuelling records include one or more of the following:

- logbook
- oil record book
- port authority documentation

Emergency situations include one or more of the following:

- fire
- hose rupture
- spillage

Appropriate authorities include one or more of the following:

- environmental protection authority
- fire and emergency services
- port authority

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC3001A Manage fuel systems.

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 MARC008 Manage fuel systems

Modification History

Release 2. Performance Evidence and Knowledge Evidence amended to include correct information.

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 on at least one occasion and include:

- carrying out accurate and reliable calculations dealing with bunkering capacity, consumption of fuel, speed and range of vessel
- completing required records
- managing refuelling to ensure safety of operation and avoid pollution of marine environment
- measuring tank levels
- reading and interpreting manufacturer specifications and safety data sheets (SDS)/material safety data sheets (MSDS)
- recognising faulty equipment and taking appropriate action
- recognising problems and hazards during refuelling and fuel transfer operations, and taking appropriate action
- selecting and using relevant equipment required for refuelling and fuel transfer operations
- taking appropriate action in response to an accidental spillage or safety incident during refuelling and fuel transfer operations.

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:

- arrangement of fuel oil systems
- calculations involving specific fuel consumption, speed and range
- calculations of volumes
- condensation in fuel tanks
- conversion of volumes to litres
- effect of slack tanks on vessel stability
- environmental protection measures to be applied during refuelling or transfer operations
- fuel oil tank components
- fuel tank filling
- functions and responsibilities of crew during refuelling or transfer operations

- hazards and safety precautions to be observed during refuelling or transfer operations
- methods of fuel oil tank content measurement
- refuelling and fuel transfer procedures applying to commercial vessels
- specific fuel consumption
- specific gravity
- work health and safety (WHS)/occupational health and safety (OHS) and pollution control, legislation and policies.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC009 Operate and monitor marine internal combustion engines, propulsion plant and auxiliary systems

Modification History

Release 2. Range of Conditions updated to include relevant information.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to safely operate marine internal combustion engines, propulsion plant and auxiliary systems on a vessel up to 750 kW.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare for sea

1.1 Fuels and lubricating fluids required for proposed voyage are acquired

1.2 Spares and stores required for proposed voyage are acquired

- 1.3 Flammable/explosive materials are stowed and managed according to regulatory and organisational requirements
- 1.4 Work health and safety (WHS)/occupational health and safety (OHS) hazards in engine room are identified, risk assessed and corrective actions taken according to organisational practices
- 1.5 Pre-start checks are conducted on machinery and equipment according to organisational procedures and manufacturer specifications
- 1.6 Engines are started according to manufacturer specifications and vessel procedures
- 1.7 Starting faults are recognised and rectified according to manufacturer specifications and fault-finding procedures
- 2 **Operate engines, propulsion plant and auxiliary systems**
 - 2.1 Engines, propulsion plant and auxiliary systems are operated within technical specifications
 - 2.2 Main propulsion plant and auxiliary systems are operated and monitored to ensure they are within operating limits specified by vessel procedures and manufacturer recommendations
 - 2.3 Environmental implications associated with operation of engine, propulsion plant and auxiliary systems are identified and controlled where possible
 - 2.4 Accidental or operational discharge of polluting substances are recorded according to regulatory requirements and organisational procedures
 - 2.5 Operational faults are recognised and rectified in accordance with manufacturer specifications and fault-finding procedures
 - 2.6 Operational records are kept according to regulatory requirements and organisational procedures
 - 2.7 Appropriate action is taken when a malfunction or emergency occurs
- 3 **Secure vessel after voyage**
 - 3.1 Engines, propulsion plant and auxiliary systems are shut down according to manufacturer specifications and vessel procedures
 - 3.2 All damage and repairs requiring action are recorded 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.

Spares and stores include one or more of the following:

- cleaning products and materials
- grease
- liquefied petroleum gas (LPG)
- machinery spare parts
- oils
- paint
- refrigeration gas
- tools, hand and power

Flammable/explosive materials must include:

- liquid fuels
- LPG
- refrigerant gas

Work health and safety (WHS)/occupational health and safety (OHS) hazards include one or more of the following:

- heavy objects securely lashed
- leaking fuel
- loose machinery guards
- slippery decks

Engines, propulsion plant

- auxiliary equipment and associated spaces

and auxiliary systems
include one or more of the
following:

- cooling systems
- fuel systems
- gearbox
- lubricating systems
- marine two- and four-stroke:
- diesel engines
- petrol engines
- propeller and immediate shafting alignment
- pumping systems
- refrigeration systems
- steering systems
- sterndrive and water jet drive units

Environmental
implications include one
or more of the following:

- accidental release of refrigeration gas
- excessive noise
- exhaust emissions
- loss of fuel and oil overboard
- pumping bilges

Polluting substances
include one or more of the
following:

- chemicals
- oils
- refrigeration gases
- sewage

Operational records
include one or more of the
following:

- ballast log
- maintenance logs
- oil record book
- running logs

Emergencies include one
or more of the following:

- emergency steering
- failure of the main engine
- fire
- flooding

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC3005A Operate and monitor marine internal combustion engines, propulsion plant and auxiliary systems.

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 MARC009 Operate and monitor marine internal combustion engines, propulsion plant and auxiliary systems

Modification History

Release 2. Performance Evidence and Knowledge Evidence amended to include correct information.

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 on at least one occasion and include:

- explaining:
 - method of propulsion plant reversal
 - operation of marine gearboxes
 - two- and four-stroke cycles of operation
- identifying constructional parts of marine internal combustion engines
- keeping running and maintenance logs
- managing:
 - lubricating systems and preventing pollution of marine environment
 - cooling systems
 - pumping systems and preventing pollution of marine environment
 - stowage of flammable/explosive materials and refrigerant gases
- operating:
 - refrigeration system
 - marine internal combustion engines within technical specifications
- operating main propulsion plant and auxiliary systems within recommended parameters
- operating and maintaining steering systems
- preparing vessel and machinery for sea
- recognising and rectifying operational faults
- securing vessel and machinery after voyage.

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:

- bilge pumping for vessels with several compartments

- common faults:
 - in steering gear
 - of deck machinery
- construction of heat exchangers
- controllable pitch propellers (CPP) construction and operation
- coolant circulation and thermostats
- correct pressure and flow conditions
- corrosion prevention
- cross connections between:
 - bilge/ballast/seawater systems and fire main
 - seawater systems and bilge systems
- dangers associated with:
 - back-flooding and methods to prevent back-flooding
 - liquefied petroleum gas (LPG) and petrol vapours
 - refrigerant gas leaks in confined spaces
- diesel engine:
 - construction
 - operation
 - fuel injection, timing and control equipment
- dry sump and wet sump lubrication systems and components
- electrohydraulic steering gear
- emergency steering
- engine:
 - protection arrangements
 - performance and reasons for lack of performance
 - watchkeeping duties
- environmental responsibilities, regulations and legislative requirements
- gearbox fault identification and emergency operation
- governor operation
- hazards of refrigerants
- heat exchanger, keel cooler and raw water cooling systems
- lubrication and cooling:
 - of gearboxes
 - effects
- lubricating oil system faults
- method of propulsion plant reversal including CPP
- own ability and limits to rectify irregularities and faults
- preparations and checks necessary before sailing
- pump capabilities and requirements for priming
- refrigeration system and components
- reverse/reduction gearbox operation

- routine for operating and maintaining steering systems
- seawater circulating systems
- securing vessel after voyage
- ship side valves
- shutting down machinery
- spares and stores required for proposed voyage
- storage of LPG cylinders
- testing:
 - steering gear
 - LPG detectors
- turbo charging and supercharging arrangements
- types and operation of deck machinery including basic hydraulic systems
- types of:
 - gear trains
 - pumps and safety devices.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARC010 Operate electrical systems

Modification History

Release 2. Range of Conditions updated to include relevant information.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate 220 to 440 voltage alternating current (AC) electrical systems.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW or as a Marine Engine Driver Steam.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare electrical systems and equipment for operation

1.1	Risks to self, others and the environment are identified according to organisational procedures
1.2	Pre-operational checks are carried out according to manufacturer specifications and organisational procedures

2 Operate electrical systems and equipment	2.1 Electrical systems and equipment are operated according to manufacturer specifications, regulations and vessel procedures
	2.2 Performance of electrical equipment is monitored
	2.3 AC electrical supply is monitored and demand is adjusted
	2.4 Operational faults are recognised and recorded, and corrective action is taken according to manufacturer specifications and fault-finding procedures
3 Connect and disconnect ship to shore electrical supply	3.1 Vessel is positioned and secured for connecting to shore electrical supply
	3.2 Power cable is inspected and connected to shore supply
	3.3 Procedures for changing from vessel supply to shore supply are implemented following vessel procedures
	3.4 Electrical supply is monitored for correct operation according to vessel procedures
	3.5 Operational faults are recognised and recorded, and corrective action is taken according to vessel procedures
	3.6 Procedures for changing from shore supply to vessel supply are implemented following vessel procedures
	3.7 Power cable is disconnected, inspected and stored

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.

Electrical systems and equipment include one or more of the following:	• batteries • charging systems • fuses and circuit breakers • generators/alternators • motors • shore power connection • starter motors • switchboards
Adjusted include one or more of the following:	• changing electrical supply to a larger alternator • connecting further alternators in parallel • requesting non-essential electrical systems be isolated
Operational faults include one or more of the following:	• battery faults • earth faults • failure of: • starter motors • alternators to produce voltage • faults with shore power connections including phase rotations • operation of fuses and circuit breakers • operation of protection devices on the switchboard

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC3007A Operate electrical systems.

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 MARC010 Operate electrical systems

Modification History

Release 2. Performance Evidence and Knowledge Evidence amended to include correct information.

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 on at least one occasion and include:

- adjusting electrical supply to accommodate load demand
- connecting and disconnecting shore supply
- locating, interpreting and applying manufacturer specifications for electrical systems and equipment
- operating and monitoring alternating current (AC) electrical systems according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- operating and monitoring direct current (DC) systems according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation.

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:

- basic care of electrical systems and equipment in general - fault recognition
- batteries:
 - care
 - hazards
 - types
- charging systems:
 - alarms/indicators
 - regulators
- connecting batteries in series and parallel
- DC systems not exceeding 32V DC
- earth indicating devices
- electric systems (above 32 V DC and up to 415 V AC)
- emergency supply and regulatory requirements

- fault identification, location, and safety implications
- operation of starter motors, alternators and associated equipment
- personal safety
- protective devices on switchboards
- shore power connection
- single and three-phase ac power
- uses of fuses and circuit breakers:
 - selection of correct capacity
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC011 Manage a propulsion unit using appropriate engine systems and support services

Modification History

Release 2. Range of Conditions updated to include relevant information.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate a propulsion unit using appropriate engine systems and support services according to technical specifications and safe operating limits.

This unit applies to people working in the maritime industry 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

C – Equipment Operations

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 Prepare for operation

- 1.1 Routine pre-operational checks of propulsion unit, engine systems and support services are completed prior to use according to manufacturer specifications and organisational procedures

	1.2	Propulsion unit, engine systems and support services are calibrated or set up correctly
	1.3	Faults or malfunctions are identified and reported according to organisational procedures
	1.4	Work health and safety (WHS)/occupational health and safety (OHS) hazards in the work area are identified and risk is assessed and reported according to organisational procedures
2 Operate propulsion unit, engine systems and support services	2.1	Risks to self, others and the environment are identified according to organisational procedures
	2.2	Suitable personal protective equipment is selected and used according to organisational procedures
	2.3	Controls of propulsion unit, engine systems and support services are operated in a safe and controlled manner
	2.4	Performance and efficiency of propulsion unit, engine systems and support services operations is monitored
	2.5	Safe operational practices are used to anticipate and control hazards
	2.6	Adverse sea and weather conditions that may impact on operation of propulsion unit, engine systems and support services are identified and operational practices are adjusted to maintain safety of vessel and personnel
	2.7	Procedures to be undertaken in the event of emergencies are recognised and implemented
3 Complete operations and check propulsion unit, engine systems and support services	3.1	Shut-down procedures are conducted according to manufacturer instructions and organisational procedures
	3.2	Malfunctions, faults, irregular performance or damage to propulsion unit, engine systems and support services are reported according to organisational procedures
	3.3	Propulsion unit, engine systems and support services are cleaned and secured according to organisational procedures
	3.4	Operational records are completed 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.

- Propulsion unit and engine systems must include:
- ancillary systems and controls
 - bow and stern thrusters units
 - controllable pitch propellers (CPP)
 - diesel engines
 - engine systems and controls
 - gearing systems
 - hydraulic systems and controls
 - performance indicators
 - power generating units and controls
 - propeller shafting arrangements
 - pumps and pumping systems
 - safety alarm systems
 - speed and fuel consumption indicators
 - steering gear

- Support services include one or more of the following:
- air conditioning systems
 - air starting systems
 - bilge systems
 - cooling water systems
 - fire detection and suppression systems
 - fuel pumps, lines and tanks
 - lubrication systems
 - refrigeration systems
 - steering gear systems
 - waste management and pollution control systems

- water pumping systems

Emergencies must include:

- fire or explosion
- flooding
- loss of:
 - propulsion
 - electrical power
 - steering

Operational records must include:

- instructions of relevant maritime authorities
- log books
- operational orders from the organisation's safety management system
- plant and equipment manufacturer instructions and recommended procedures
- relevant sections of state and territory maritime regulations, National Standard for Commercial Vessels (NCSV) and Uniform Shipping Laws (USL) Code related to operation of propulsion plants and ancillary equipment.

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4001A Manage a propulsion unit using appropriate engine systems and support services.

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 MARC011 Manage a propulsion unit using appropriate engine systems and support services

Modification History

Release 2. Performance Evidence and Knowledge Evidence amended to include correct information.

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 on at least one occasion and include:

- carrying out necessary calculations associated with managing propulsion unit
- communicating effectively with other personnel
- keeping records of monitoring and operation of safety and fire detection/suppression equipment, and any required remedial action
- maintaining records of operation and maintenance of propulsion unit, ancillary power units, equipment and any related safety incidents
- monitoring and evaluating performance of propulsion unit, ancillary power units and equipment
- reading and interpreting:
 - manufacturer instructions for operation of propulsion systems and auxiliary systems
 - maritime regulations, rules and instructions
- recognising problems that may occur with remote control of propulsion unit, ancillary power units and equipment, and taking appropriate preventative and remedial action
- recognising when performance of propulsion unit or ancillary power units and equipment is unsatisfactory or outside specified limits and taking appropriate action
- working collaboratively with other shipboard personnel and passengers during vessel operations.

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:

- characteristics of propulsion units, ancillary power units and equipment including operational limits, vessel stopping distances and turning circles at various draughts, speeds and conditions of loading
- dangers associated with operation of shipboard ancillary power units and related hazard prevention strategies
- marine engineering terms

- methods for controlling and managing operation of shipboard propulsion units, ancillary power units and equipment
- principles of operation and control of various shipboard emergency systems
- problems associated with remote control of propulsion unit, ancillary power units and equipment and appropriate preventative and remedial action and solutions
- procedures for monitoring and evaluating performance of propulsion unit, ancillary power units and equipment
- relevant sections of state and territory maritime regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
- relationship between vessel speed and fuel consumption, including meaning of economical revolutions per minute (RPM) and its application
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- requirements for waste management and control systems under the MARPOL Convention
- Sequence of required action when power unit becomes overloaded.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC012 Monitor and manage vessel operations

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to plan and oversee activities associated with the regulatory and operational requirements for the continued performance and safety of a coastal vessel.

This unit applies to people working in the maritime industry 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

C – Equipment Operations

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 Develop operational strategies and procedures	1.1 Action plan is developed to provide a clear and coherent direction according to organisational goals and objectives
	1.2 Work health and safety (WHS)/occupational health and safety (OHS) and environmental issues are identified, and strategies are implemented to minimise risk factors
	1.3 Quality system is developed for vessel in line with industry

		standards, compliance and organisational requirements
	1.4	Performance measures and operational targets are developed to conform with business plan
	1.5	Procedures are established and implemented according to organisational and legislative requirements
	1.6	Procedures are communicated to crew members
2	Supervise crew compliance with regulatory requirements	
	2.1	Regulatory body requirements are correctly interpreted and applied
	2.2	Instructions for crew members are developed and implemented
	2.3	Crew members are briefed
	2.4	Liaison with regulatory body officials is undertaken
3	Plan resources for vessel operations	
	3.1	Vessel resource and equipment requirements are investigated and documented
	3.2	Resource needs are prioritised and matched to vessel budget, and priorities are confirmed after consultation with crew members
	3.3	Procurement plan with prioritised purchasing is devised and resources are procured accordingly
4	Plan vessel operations logistics	
	4.1	Operational work plans are developed
	4.2	Operations are checked to ensure optimum use of human and physical resources
	4.3	Tasks are implemented according to plans and specifications
	4.4	Operational plans are implemented and crew members are briefed as to roles and responsibilities
	4.5	Operational plans are documented and amended according to procedures and crew expectations
	4.6	Proposed variations are investigated and negotiated in consultation with crew members
5	Evaluate operational processes	
	5.1	Operational progress is closely monitored against required quality of work and adherence to both budget and time schedule

- 5.2 Opportunities for preventative or corrective changes are identified using outcomes of monitoring activities and feedback from crew members
- 5.3 Preventative and/or corrective action is recommended and implemented
- 5.4 Changes are communicated to appropriate persons in a logical and easily understood manner
- 5.5 Changes are monitored to confirm improvement in crew efficiency

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.

Action plan must include:

- cargo plan
- dry-docking and slipping operations
- planned maintenance system
- safety management plan
- voyage planning

Work health and safety (WHS)/occupational health and safety (OHS) and environmental issues

- working at heights
- working in:
 - confined spaces
 - freezer spaces

include:

- working overside on stages

Operational targets include one or more of the following:

- achievement of key performance indicators (KPIs) from the business plan
- optimum fuel usage
- on time completion of survey and docking operations
- passage planning to achieve safe and efficient routing

Vessel resource and equipment requirements include one or more of the following:

- charts and publications for the intended voyage
- stores, fuel and spare parts sufficient for the voyage
- tools and equipment necessary to conduct planned maintenance

Operational work plans include one or more of the following:

- docking and repair plans
- managing confined space entry
- passage planning
- periodic survey requirements

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4002A Monitor and manage vessel operations.

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 MARC012 Monitor and manage vessel operations

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 on at least one occasion and include:

- collecting, organising and understanding information related to vessel resource and logistic requirements
- communicating ideas and information to enable input from crew and understanding by crew of plans developed
- completing a review of and updating the process for, vessel operations
- developing effective planning documents
- liaising with other crew members on a range of operational issues and challenges
- monitoring and responding to compliance issues and measuring progress against agreed objectives
- planning and organising activities including consulting with crew to determine resource and logistics requirements, and developing, implementing and reviewing operational plans
- undertaking a job safety analysis for working in areas of high risk
- using information gathering techniques to determine crew requirements and developing strategies to address these
- using mathematical techniques to correctly interpret budgets and estimate material requirements.

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:

- analytical tools
- decision-making models and techniques
- information gathering strategies
- logistics and procurement management techniques
- operational plan development
- resource availability.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC013 Operate auxiliary machinery systems up to 1500 kW

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate auxiliary machinery systems up to 1500 kW according to technical specifications and safe operating limit.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare for operation

- 1.1 Risks to self, others and the environment are identified according to organisational procedures
- 1.2 Routine pre-operational checks of auxiliary machinery systems are completed prior to use according to manufacturer specifications and organisational procedures

2 Operate auxiliary machinery systems

- 2.1 Suitable personal protective equipment is selected and used according to organisational procedures

	2.2	Auxiliary machinery systems are operated in a safe and controlled manner
	2.3	Performance of auxiliary machinery system operations are monitored
	2.4	Adverse sea and weather conditions that may impact on operation of auxiliary machinery systems are identified and operational practices are adjusted to maintain safety of vessel and personnel
	2.5	Faults or malfunctions are identified and recorded according to organisational procedures
	2.6	Faults or malfunctions are rectified and corrective actions are taken and recorded according to organisational procedures
	2.7	Procedures to be undertaken in emergencies are recognised and implemented
3	Complete operations and check auxiliary machinery systems	
	3.1	Shut-down procedures are conducted according to manufacturer instructions and organisational procedures
	3.2	Operational records are completed as required according to organisational procedures and regulatory requirements

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.

Auxiliary machinery systems must include:

- cargo discharging or loading systems
- commercial refrigeration and freezer plants
- compressed air
- control air systems
- deck machinery
- hydraulics
- fire, bilge and ballast pumping systems
- fixed gas and foam firefighting systems
- fresh water generation
- fuel and lubricating oil purification systems
- sewage treatment
- steering system including rudder

Emergencies must include:

- loss of:
 - control air pressure
 - electrical power
- failure of steering system
- hydraulic failure

Operational records must include:

- logbooks
- maintenance records
- plant and equipment manufacturer instructions and recommended procedures
- relevant maritime authority documentation relating to operating auxiliary machinery systems
- standard operating procedures from the organisation's safety management system

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4003A Operate auxiliary machinery systems up to 1500 kW.

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 MARC013 Operate auxiliary machinery systems up to 1500 kW

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 on at least one occasion and include:

- maintaining records of the operation and maintenance of auxiliary machinery systems and any related safety incidents
- monitoring and evaluating performance of auxiliary machinery systems
- operating all equipment
- reading and interpreting:
 - manufacturer instructions for the operation of auxiliary machinery systems
 - maritime regulations, rules and instructions
- recognising when the performance of auxiliary machinery systems is unsatisfactory or outside specified limits and taking appropriate action
- recognising problems that may occur with auxiliary machinery systems and taking appropriate preventative and remedial action.

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:

- alarm panels
- auxiliary systems, materials and construction
- awareness of one's surroundings and changes to these surroundings
- causes of deck machinery faults
- characteristics of auxiliary machinery systems
- closing devices and remote shut offs
- dangers associated with operating shipboard auxiliary machinery systems and related hazard prevention strategies
- drive systems, belts, clutches and motors
- electro-hydraulic steering gear
- emergency operation in electrical or hydraulic failure
- emergency shut offs and closures
- fire detection and fire alarm systems
- fixed firefighting installations including CO₂, foam and water mist

- function of:
 - grease
 - lubricating oil
- hydraulic systems including steering gear
- identification of:
 - refrigeration system components
 - faults in refrigeration systems
- instrumentation used
- methods for controlling and managing operation of shipboard auxiliary machinery systems
- operation of deck machinery
- own ability and limits to rectify irregularities or faults
- problems associated with auxiliary machinery systems, and appropriate preventative and remedial action and solutions
- procedures for monitoring and evaluating performance of auxiliary machinery systems
- pumps and pumping systems for bilge, fire, fuel oil, freshwater and seawater systems
- refrigeration:
 - cycle
 - plant and its operation
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- relevant sections of commonwealth, state and territory maritime regulations, National Standard for Commercial Vessels (NSCV)
- requirements for waste management and pollution control from auxiliary machinery systems under the International Convention for the Prevention of Pollution from Ships (MARPOL)
- rudder and stock support bearings, glands, packing and seals
- rudder construction and rudder types
- safe:
 - operation practices
 - working procedures
- safeguards and protective devices for deck machinery
- simple hydraulic circuits
- strainers, mud-boxes and foot valves
- terminology of materials technology
- types of:
 - fixed firefighting systems including gas and foam flooding systems
 - pumps and associated safety devices
 - refrigerant
- winches and windlass.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC014 Operate deck machinery and steering gear on a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate steering gear and deck machinery on a vessel up to 80 metres.

This unit applies to people working in the maritime industry 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

C – Equipment Operations

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 Prepare for operation

- 1.1 Routine pre-operational checks of steering gear or deck machinery are completed prior to use according to manufacturer specifications and organisational procedures
- 1.2 Equipment is set up
- 1.3 Tools and equipment appropriate to work requirements are selected, checked for safety and set up for operation

	1.4	Equipment faults or malfunctions are identified and reported according to organisational procedures
	1.5	Work health and safety (WHS)/occupational health and safety (OHS) hazards in the work area are identified, and risks are assessed and reported according to organisational procedures
2 Operate steering gear and deck machinery	2.1	Suitable personal protective equipment is selected and used according to organisational procedures
	2.2	Steering gear and deck machinery are operated in a safe and controlled manner
	2.3	Performance and efficiency of steering gear and deck machinery operations is monitored
	2.4	Safe operational practices are used to anticipate and control hazards
	2.5	Adverse sea and weather conditions which may impact on the operation of steering gear and deck machinery are identified and operational practices are adjusted to maintain safety of vessel and personnel
3 Complete operations	3.1	Shut-down procedures are conducted according to manufacturer instructions and organisational procedures
	3.2	Malfunctions, faults, irregular performance or damage to steering gear and deck machinery are reported according to organisational procedures
	3.3	Steering gear and deck machinery is cleaned and secured according to organisational procedures
	3.4	Operational records are completed 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.

Steering gear or deck machinery includes one or more of the following:	• basic hydraulic systems • cranes • emergency steering gear • fishing gear • steering gear • winches and capstans • windlass

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4004A Operate deck machinery and steering gear on a vessel up to 80 metres.

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 MARC014 Operate deck machinery and steering gear on a vessel up to 80 metres

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 on at least one occasion and include:

- communicating effectively with others
- completing required records relating to the operation of steering gear and deck machinery
- following work schedules laid down in organisational instructions and safety management systems
- initiating and operating emergency steering systems
- reading, interpreting and applying instructions on the operation of steering gear and deck machinery
- recognising faulty equipment and taking appropriate action
- recognising routine hazards and problems while operating steering gear and deck machinery
- selecting and using relevant tools and equipment
- working safely and collaboratively with others when operating and maintaining deck machinery and steering gear.

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:

- basic principles of hydraulics
- communication techniques and signals needed during the operation of steering gear and deck machinery on vessels up to 80 metres
- principal features and operating characteristics of steering gear and deck machinery used on vessels up to 80 metres
- problems related to the operation of steering gear and deck machinery and appropriate actions and solutions
- procedures for checking and inspecting steering gear and deck machinery used on vessels up to 80 metres
- procedures for the safe operation of steering gear and deck machinery
- procedures for, and operation of, emergency steering systems
- records that must be maintained on a vessel up to 80 metres

- relevant state and territory maritime work health and safety (WHS)/occupational health and safety (OHS) and pollution control regulations and policies
- safety, environmental and hazard control precautions and procedures relevant to the operation of steering gear and deck machinery.

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 currently used in industry including:
 - greasing and lubrication tools
 - hand and power tools, including screwdrivers, drills, grinders, spanners, wrenches, wire cutters.
 - protective clothing and equipment
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

Companion Volume implementation guides are found in VETNet -

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

MARC015 Operate marine internal combustion engines and associated systems up to 1500 kW

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate a marine internal combustion engine and associated systems up to 1500 kW according to technical specifications and safe operating limits.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare for operation

- 1.1 Risks to self, others and the environment are identified according to organisational procedures
- 1.2 Routine pre-operational checks of marine internal combustion engines and associated systems are completed prior to use according to manufacturer specifications and

		organisational procedures
2 Operate marine internal combustion engines and associated systems	2.1	Suitable personal protective equipment is selected and used according to organisational procedures
	2.2	Marine internal combustion engines and associated systems are operated in a safe and controlled manner
	2.3	Performance of marine internal combustion engines and associated systems operations is monitored
	2.4	Adverse sea and weather conditions that may impact on operating marine internal combustion engines and associated systems are identified and operational practices are adjusted to maintain safety of vessel and personnel
	2.5	Faults or malfunctions are identified and recorded according to organisational procedures
	2.6	Faults or malfunctions are rectified where possible and corrective actions are taken and recorded according to organisational procedures
	2.7	Restrictions are applied to operations if necessary and are agreed to with the Master
	2.8	Procedures to be undertaken in of emergencies are recognised and implemented
3 Complete operations	3.1	Shut-down procedures are conducted according to manufacturer instructions and organisational procedures
	3.2	Operational records are completed 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.

Associated systems must include:

- air start
- control systems
- cooling system
- dual fuel systems
- exhaust systems
- lubrication systems

Monitored includes one or more of the following:

- conducting performance tests
- reading gauges and instruments
- responding to alarms

Emergencies must include:

- explosion
- failure or major fault in propulsion engines and associated control systems
- fire
- loss of:
- bridge control
- electrical supply
- propulsion power
- steering
- major breakdowns

Operational records must include:

- logbooks
- maintenance records
- operational orders from organisational safety management system
- plant and equipment manufacturer instructions and recommended procedures
- relevant maritime authorities documentation relating to operating marine internal combustion engines and associated systems

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4005A Operate marine internal combustion engines and associated systems up to 1500 kW.

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 MARC015 Operate marine internal combustion engines and associated systems up to 1500 kW

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 on at least one occasion and include:

- carrying out necessary calculations associated with managing marine internal combustion engines and associated systems including calculating:
 - areas and volumes of various shapes and circumference of circles
 - calibration tables
 - lubricating oil and fuel oil consumption, rate of fuel consumption (RFC), specific fuel consumption (SFC), effects on RFC and fuel requirements due to change in vessel speed or voyage deviations
 - relationship between vessel speed and fuel consumption, including the meaning of economical revolutions per minute (RPM) and its application
 - tank capacities and pumping capacities for filling and emptying
- maintaining records of operating and maintaining marine internal combustion engines and associated systems, and any related safety incidents
- reading and interpreting:
 - manufacturer instructions for operating marine internal combustion engines and associated systems
 - maritime regulations, rules and instructions
- reading and monitoring various gauges and instruments to evaluate the performance of marine internal combustion engines and associated systems
- recognising problems that may occur with marine internal combustion engines and associated systems, and taking appropriate preventative and remedial action
- recognising when performance of marine internal combustion engines and associated systems is unsatisfactory or outside of specified limits and taking appropriate action.

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:

- characteristics of marine internal combustion engines and associated systems including operational limits
- control systems

- cooling water system and components
- crankcase explosions and appropriate preventative and remedial action and solutions
- dangers associated with operating shipboard marine internal combustion engines and associated systems, and related hazard prevention strategies
- engine protection arrangements
- force diagrams
- fuel system including pumps and injectors
- lubricating oil systems and components
- materials and construction techniques of marine internal combustion engines and associated systems
- methods for controlling and managing the operation of shipboard marine internal combustion engines and associated systems
- own ability and limits to rectify irregularities and faults
- pollution control measures under relevant local, state, territory and commonwealth legislation
- problems associated with marine internal combustion engines and associated systems, and appropriate preventative and remedial action and solutions
- procedures for monitoring and evaluating performance of marine internal combustion engines and associated systems
- relationship between vessel speed and fuel consumption, including the meaning of economical RPM and its application
- relevant sections of state and territory maritime regulations and NSCV
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- requirements for emission control from internal combustion engines under the International Convention for the Prevention of Pollution from Ships (MARPOL)
- sequence of required action when there is a major fault on main propulsion engine
- surroundings and changes to these surroundings
- technological changes in engine and control system designs
- turbocharging systems.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARC016 Operate propulsion transmission systems up to 1500 kW

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate propulsion transmission systems up to 1500 kW according to technical specifications and safe operating limits.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

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 Prepare for operation

- 1.1 Risks to self, others and the environment are identified and precautions are taken to minimise risk according to organisational procedures
- 1.2 Routine pre-operational checks of propulsion transmission systems are completed prior to use according to manufacturer specifications and organisational procedures

2 Operate propulsion transmission systems	2.1 Suitable personal protective equipment is selected and used according to organisational procedures 2.2 Propulsion transmission systems are operated in a safe and controlled manner 2.3 Performance of propulsion transmission system operations is monitored 2.4 Faults or malfunctions are identified and recorded according to organisational procedures 2.5 Faults or malfunctions are rectified and corrective actions are taken and recorded according to organisational procedures 2.6 Procedures to be undertaken in emergencies are recognised and implemented
3 Complete operations	3.1 Shut-down procedures are implemented according to manufacturer instructions and organisational procedures 3.2 Operational records are completed 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.

Propulsion transmission	• control system • fixed pitch and controllable pitch propellers

- systems must include:
- gearbox and reduction gear arrangements
 - intermediate bearings
 - propeller types and arrangements
 - shafting arrangements
 - stern tube and their systems
 - transmission system

- Emergencies must include:
- failure or major fault in:
 - propulsion transmission system or associated systems

- Operational records must include:
- logbooks
 - maintenance scheduling and maintenance records from organisation's safety management system
 - plant and equipment manufacturer instructions and recommended procedures

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4006A Operate propulsion transmission systems up to 1500 kW.

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 MARC016 Operate propulsion transmission systems up to 1500 kW

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 on at least one occasion and include:

- carrying out necessary calculations associated with managing propulsion transmission systems including:
 - calculating gear box ratios
 - theoretical distance
 - propeller slip
- maintaining records of operating and maintaining propulsion transmission systems and any related safety incidents
- operating emergency power transmission system
- reading and interpreting:
 - manufacturer instructions for operating propulsion transmission systems
 - maritime regulations, rules and instructions
- reading and monitoring various gauges and evaluating performance of propulsion transmission systems
- recognising problems that may occur with propulsion transmission systems and taking appropriate preventative and remedial action
- recognising when performance of propulsion transmission systems is unsatisfactory or outside of specified limits and taking appropriate action.

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:

- characteristics of propulsion transmission systems including operational limits
- fault identification on gearbox
- gearbox:
 - construction and materials
 - lubricating and cooling systems and components
- methods for controlling and managing the operation of shipboard propulsion transmission systems
- own ability and limits to rectify irregularities and faults.

- problems associated with propulsion transmission systems and appropriate preventative and remedial action and solutions
- procedures for monitoring and evaluating performance of propulsion transmission systems
- propeller shape, design and materials
- propeller types and arrangements including fixed pitch and controllable pitch propellers
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- reverse and reduction gearbox construction and operation
- shaft:
 - bearings
 - seals and glands
- shafting materials
- steerable/rudder propellers
- stern and jet water drive
- stern tube bearing systems including lubrication, materials and components
- types of gear trains.

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.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARC017 Operate 240 to 440 voltage alternating current electrical systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate a 240 to 440 voltage alternating current (AC) electrical system according to technical specifications and safe operating limits.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

WARNING: Relevant state/territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.

Pre-requisite Unit

Not applicable.

Competency Field

C - Equipment Operations

Unit Sector

Not applicable.

Elements and Performance Criteria

1 Prepare for operation	1.1	Risks to self, others and the environment are identified according to organisational procedures
	1.2	Routine pre-operational checks of electrical systems are completed prior to use according to manufacturer specifications and organisational procedures

2 Operate electrical systems	2.1 Suitable personal protective equipment is selected and used according to organisational procedures 2.2 Electrical systems are operated in a safe and controlled manner 2.3 Performance of direct current (DC) and AC electrical systems is monitored 2.4 AC electrical demand is monitored and additional generators are paralleled or disconnected as required 2.5 Ship to shore electrical supply is connected and disconnected when required following established practices and organisational procedures 2.6 Faults or malfunctions are identified and reported according to organisational procedures 2.7 Faults or malfunctions are rectified and corrective actions are taken and recorded according to organisational procedures 2.8 Procedures to be undertaken in emergencies are recognised and implemented
3 Complete operations and check electrical systems	3.1 Shut-down procedures are conducted according to manufacturer instructions and organisational procedures 3.2 Operational records are completed 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.

Electrical systems must include:

- alternators
- batteries and associated circuits
- control circuits
- fire detection
- motors
- starter circuits
- switchboard

Emergencies must include:

- failure of:
- generator
- emergency generator
- fire
- flooding

Operational records must include:

- logbooks
- maintenance records
- operational orders from the organisation's safety management system
- plant and equipment manufacturer instructions and recommended procedures
- relevant maritime authorities documentation relating to operating electrical systems

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4007A Operate 240 to 440 voltage alternating current electrical systems.

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 MARC017 Operate 240 to 440 voltage alternating current electrical systems

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 on at least one occasion and include:

- carrying out necessary calculations associated with managing electrical systems including:
 - battery ampere-hours and efficiency
 - series and parallel configuration of battery supply
 - adding resistors in series and parallel, and calculating current
- connecting to shore power
- isolating electrical circuits
- maintaining records of operating and maintaining electrical systems, and any related safety incidents
- monitoring and evaluating performance of electrical systems
- performing switchboard operations including the monitoring of electrical supply and procedures for paralleling generators
- reading and interpreting:
 - manufacturer instructions for the operation of electrical systems
 - maritime regulations, rules and instructions
- recognising problems that may occur with electrical systems and taking appropriate preventative and remedial action
- recognising when performance of electrical systems is unsatisfactory or outside of specified limits and taking appropriate action
- starting emergency generator and supply switchboard where available
- using hydrometer
- using multi-meter to test for voltage and continuity.

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:

- battery:
 - operation
 - charging circuits and hazards associated with charging batteries

- types, care and hazards
- characteristics of electrical systems
- dangers associated with operation of shipboard electrical systems and related hazard prevention strategies
- earth detection devices
- electrical distribution systems including emergency arrangements
- faults associated with electrical systems and appropriate preventative and remedial action, and solutions
- methods for managing operation of shipboard electrical systems
- motor and alternator construction
- motor starter circuits
- own ability and limits to rectify irregularities and faults
- principles of operation of various shipboard emergency systems including fire detection system, internal communications system and emergency generator
- procedures for monitoring and evaluating performance of electrical systems
- relevant sections of state and territory maritime regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- safety devices fitted to switchboard and other electrical systems including fuses and circuit breakers
- sequence of required action when power unit becomes overloaded
- shore power arrangements
- single and three phase AC power generation.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARC018 Employ tools, equipment and materials in a shipboard context

Modification History

Release 2. Duplication of information removed from Application.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to employ tools, equipment and materials to perform maintenance activities on a vessel. It includes the use of hand, power and machine tools, welding equipment, heat treatment processes, soldering operations, adhesives and bonding materials in performing routine and non-routine maintenance activities.

This unit applies to the work of a Marine Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment Operations

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 Follow safe work practices

- 1.1 Work health and safety (WHS)/occupational health and safety (OHS) procedures relevant to using tools and equipment in a shipboard context are complied with
- 1.2 Safety hazards are identified and reported according to safety

- and vessel procedures
- 1.3 Prior to use, tools and equipment needed to carry out maintenance activities are checked for correct operation and safety according to safety and vessel procedures
 - 1.4 Before commencing maintenance activities, isolation precautions are implemented according to safety and vessel procedures
- 2 Carry out heat treatment**
- 2.1 Requirements of job are determined from engineering drawings, job sheet or supervisor
 - 2.2 Heat treatment equipment is selected for required heat treatment according to safety, workplace and manufacturer requirements
 - 2.3 Equipment is set up and used according to standard operating procedures and manufacturer instructions
 - 2.4 Personal protective equipment (PPE) is used according to standard operating procedures
 - 2.5 Emergency procedures are complied with according to approved safety instructions
 - 2.6 Safety signs and symbols are identified and complied with according to approved safety instructions
 - 2.7 Heat treatment process is applied according to job, safety and workplace requirements
 - 2.8 Hazardous conditions are identified and risk control measures are implement to maintain a safe work environment
- 3 Use hand tools**
- 3.1 Hand tools are used according to workplace procedures, WHS/OHS requirements and manufacturer instructions.
 - 3.2 Faults with hand tools and equipment are identified and reported to appropriate personnel
- 4 Use hand power tools**
- 4.1 Hand power tools are used according to workplace procedures, WHS/OHS requirements and manufacturer instructions.
 - 4.2 Faults with hand power tools and equipment are identified and reported to appropriate personnel
- 5 Perform onboard pipe work**
- 5.1 Job requirements are determined from engineering drawings, job sheet or supervisor

- 5.2 Sequence of operations is determined according to workplace, WHS/OHS and job requirements
- 5.3 Pipe work is fabricated and joined according to relevant standards, and job, safety and workplace requirements
- 5.4 Pipe work is inspected for defects according to workplace procedures
- 5.5 Pipe work is installed in specified location without damage or distortion to pipe work, surrounding environment or other services
- 5.6 Type of filters and strainers in shipboard piping systems are located and determined using relevant engineering drawings and specifications
- 5.7 Pipe work is tested for compliance with job specification and workplace requirements
- 6 Use machine tools**
 - 6.1 Job requirements are determined from engineering drawings, job sheet or supervisor
 - 6.2 Sequence of operations is determined according to workplace, WHS/OHS and job requirements
 - 6.3 Machine tools are selected according to workplace procedures, WHS/OHS requirements and manufacturer instructions
 - 6.4 Machining operations are performed according to workplace, WHS/OHS and job requirements
 - 6.5 Components are measured in line with workplace, WHS/OHS and job requirements
 - 6.6 Machine is adjusted and maintained according to workplace, safety, manufacturer and job requirements
- 7 Perform welding and thermal cutting operations**
 - 7.1 Job requirements are determined from engineering drawings, job sheet or supervisor
 - 7.2 Materials are prepared for welding using correct tools, equipment, materials and procedures
 - 7.3 Materials are welded using appropriate welding process according to relevant standards and job, safety and workplace requirements

	7.4	Joints are welded according to relevant standards and job, safety and workplace requirements
	7.5	Oxygen fuel gas cutting torch is used to cut straight lines and curves in mild steel plate up to 10 mm thick according to relevant standards and job, safety and workplace requirements
	7.6	Weld is inspected according to relevant standards, and job and workplace requirements
8 Perform soldering operations	8.1	Job requirements are determined from engineering drawings, job sheet or supervisor
	8.2	Materials are prepared for soldering using correct tools, equipment, materials and procedures
	8.3	Materials are soldered according to relevant standards and job, safety and workplace requirements
	8.4	Soldered joints are performed according to relevant standards and job, safety and workplace requirements
	8.5	Soldered joints are inspected according to relevant standards and job, and workplace requirements
	8.6	Materials are desoldered using correct procedure and minimising damage to materials/components
9 Select and use sealants, adhesives, bonding agents, gaskets and packings	9.1	Job requirements are determined from engineering drawings, job sheet or supervisor
	9.2	Gaskets and packings are selected and used according to job requirements and manufacturer/component supplier instructions
	9.3	Sealants and adhesives are selected and used according to job requirements and manufacturer/component supplier instructions
	9.4	Plastic bonding is performed according to job requirements and manufacturer/component supplier instructions
	9.5	Sealants, adhesives, bonding agents, gaskets and packings are stored according to workplace and manufacturer/component supplier instructions

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.

Heat treatment process include one or more of the following:

- annealing
- hardening
- normalising
- tempering

Hand tools include one or more of the following:

- anvil
- benders
- brushes
- chisels
- chucks
- cutters
- drills
- drivers
- files
- gear pullers
- hacksaws
- hammers
- nippers
- pliers
- punchers
- reamers
- scissors
- scrapers
- spanners

- swage block
- taps and dies
- vices
- wrenches

Hand power tools include one or more of the following:

- drills
- grinders
- hand shear and nibbler
- impact wrenches
- portable jigsaw
- sanders

Pipe work defects include one or more of the following:

- ovality
- thinning

Machine tools include one or more of the following:

- drills
- grinder
- lathes
- milling machines

Welding process include one or more of the following:

- gas metal arc welding
- gas tungsten arc welding
- oxy-acetylene welding
- shielded metal arc welding

Joints include one or more of the following:

- butt
- fillet joints:
- corner joints
- lap joints
- tee joint plate edge preparations
- throat length with concave and convex reinforcement

Soldered joints include one of the following :

- hard
- soft

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC5001A Employ tools, equipment and materials.

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 MARC018 Employ tools, equipment and materials in a shipboard context

Modification History

Release 2. Duplication of information removed from Application.

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 on at least one occasion and include:

- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- communicating procedures associated with using hand and machine tools and equipment verbally and in writing
- identifying methods, procedures and materials needed for operating hand and power tools on vessels
- initiating timely action in response to defects or damage
- reading and interpreting written information related to operating tools and equipment used for maintenance operations on board vessels, including technical manuals and specifications
- safely using hand and machine tools.

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:

- characteristics, limitations and use of metals and non-metallic materials used in ship construction and repair
- hand and power tools and component:
 - types
 - operational characteristics and performance specifications
 - maintenance
- heat treatment:
 - material characteristics
 - applications, equipment and processes
 - emergency procedures
 - material preparation, quenching, preheating requirements
 - material condition during heat treating process

- batch and/or piece loading of furnaces
- safe loading of furnaces
- hazards and control measures associated with heat treatment, including housekeeping
- use and application of personal protective equipment (PPE)
- safe work practices and procedures
- machine tools:
 - reasons for selecting chosen sequence of operations
 - methods of work holding
 - basic marking out techniques including datum points/lines
 - geometry of cutting tools for a range of materials and applications
 - benefits of using correctly sharpened cutting tools
 - machine operation
 - selection of feeds and speeds to suit a range of materials and operations within the scope of this unit
 - correct methods of mounting a variety of cutting tools
 - safety issues with regard to correct clamping, guards and shields
 - tolerances and limits of size
 - situations indicating need for machine adjustment, lubrication and cleaning
 - techniques, tools and equipment to measure materials and machined components
 - use and application of PPE
 - safe work practices and procedures
 - hazards and control measures associated with general machining
- materials used in ship construction and repair:
 - metallurgy principles
 - types of materials
 - limitations of materials
 - properties of materials
- national and international regulations, International Maritime Organization (IMO) Conventions and Codes, including Australian Maritime Safety Authority (AMSA) Marine Orders applicable to managing shipboard plant and equipment maintenance and repair operations on vessels
- own ability and limits to rectify irregularities and faults
- pipe work:
 - installation techniques
 - purging techniques, applications and precautions
 - capping/sealing pipe work and assembly methods
 - identifying location/layout of pipe work and assemblies, and application and characteristics of enclosure/hanging/supporting systems
 - pipe work, ancillary installation and joining procedures
 - leak testing applications and uses

- procedures for completing temporary and permanent repair and/or replacement procedures for plant and equipment on board vessels at sea, alongside and in dry dock
- properties and parameters of engineering materials
- safety data sheets (SDS)/material safety data sheets (MSDS)
- sealants, gaskets, bonding agents, adhesives and packing:
 - dangers of working with sealants and adhesives
 - operating principles of gaskets and their relationship to other components
 - types, characteristics, uses and limitations of sealants and adhesives
 - gasket installation procedures
 - sealant and adhesives application techniques
- soldering:
 - cleaning solutions and properties, and cleaning procedures
 - use and application of PPE for manual soldering/desoldering
 - methods of joint preparation
 - properties of fluxes and their uses
 - heat and damage protection procedures
 - procedures for preventing electrostatic discharge damage
 - soldered joint testing and inspection procedures
 - reworking procedures and precautions
- testing procedures for materials under load:
 - compressive load testing procedures
 - shear load testing procedures
 - tensile load testing procedures
- welding:
 - characteristics and properties of common metals and welding materials
 - effect of gas and electrical welding operations on metals
 - hazards and control measures associated with gas and electrical welding, including housekeeping
 - welding safety practices and procedures
 - effect of various treatments on a range of commonly used metals
 - use and application of PPE
- work health and safety (WHS)/occupational health and safety (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 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARD001 Manage business and administration on vessels limited by tonnage or near coastal operations

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage the business and administration of a commercial ocean-going vessel and its personnel in compliance with Australian and international regulations and guidelines, and to ensure the protection of the marine environment and the safety of the vessel and people on board.

Managing vessel business operations and resources includes legal and commercial responsibilities, the safety management system (SMS), procedures to obtain a safety management certificate and subsequent audits, managing work health and safety (WHS)/occupational health and safety (OHS) procedures and practices, monitoring and controlling expenditure, and analysing and preparing reports.

It also involves organising and managing crew, and includes allocating duties, conducting required training, and assessing and maintaining expected standards of work and behaviour.

This unit applies to people who work in the maritime industry as Master or Chief Mate on a vessel of up to 500 gross tonnage (GT) or as a Watchkeeper on a vessel up to 3000 GT or as Master or Chief Mate on vessels up to 3000 GT operating in near coastal waters.

The unit is consistent with the relevant sections of STCW 95 and Marine Orders under the Australian Navigation Act 2012.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

D – Administration and Human Resources

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 Develop plans for general and specific vessel operations

- 1.1 Vessel operation goals and objectives are identified according to company procedures, operational orders, regulatory requirements and established marine management practice
- 1.2 General and specific vessel operations plans are drawn up according to company procedures
- 1.3 Correct procedures for emergency response on board a vessel are developed according to company procedures, operational orders, regulatory requirements and established marine management practice
- 1.4 Appropriate validation measures and standards are devised to monitor progress in operations against plans, and appropriate contingency plans are developed for any discrepancies or variations that may occur during operations
- 1.5 Service procedures and systems improvement opportunities are identified and appropriate measures are taken to act on these opportunities according to company procedures and established marine management practice
- 1.6 Plans, goals, objectives and instructions for general and specific vessel operations and emergency and contingency procedures are distributed to relevant personnel according to company procedures and established marine management practice

2 Ensure legal requirements are fulfilled

- 2.1 Legal basis under which a commercial vessel operates is interpreted and followed, and shipmaster safety, legal and commercial obligations are identified and carried out in a relevant range of operational circumstances
- 2.2 National and international conventions, laws and regulations pertaining to vessel operations and contingencies are implemented
- 2.3 Entries are made into vessel log books as required and carriage of all required vessel certification is confirmed and

		ensured
	2.4	Appropriate arrangements are made for preparing vessel for statutory survey and certification
	2.5	Relevant code of conduct and industrial agreements are applied to vessel operations and management, and shipmaster responsibilities as they relate to crew health and safety are implemented
	2.6	Vessel security procedures are consistent with International Maritime Organization (IMO) International Ship and Port Facility Security Code (ISPS Code)
	2.7	Procedures and requirements relating to state port control are implemented
	2.8	Procedures and requirements relating to customs, quarantine and immigration clearances are implemented
3	Ensure commercial and business requirements are fulfilled	
	3.1	Contracts of carriage and bills of lading under which vessel owners and cargo owners operate are interpreted and adhered to according to company procedures, legal requirements and established marine management practice
	3.2	Commercial and legal aspects of general average, salvage and towage are identified, interpreted and implemented according to company procedures, legal requirements and established marine management practice
	3.3	Commercial and legal aspects of marine hull and cargo insurance are identified, interpreted and implemented according to company procedures, legal requirements and established marine management practice
	3.4	Accident and incident investigation processes are identified and implemented according to company procedures, legal requirements and established marine management practice
4	Monitor and control vessel expenditure	
	4.1	Accrual accounting procedures are correctly used to monitor and control vessel expenditure and where relevant, vessel budget is prepared according to established vessel financial procedures and established accounting practice, with relevance to commercial market in which a vessel operates
	4.2	Plans and appropriate contingency procedures are developed to correct any variation from vessel budget and identified expenditure, and records are maintained according to established vessel financial procedures and established

		accounting practice
	4.3	Appropriate action is taken when expenditure varies from vessel budget according to contingency plans, company procedures and established accounting practice
5 Develop and implement vessel safety management system	5.1	Vessel SMS is developed according to relevant maritime regulations and company procedures
	5.2	SMS safety procedures and related documentation are developed in collaboration with relevant vessel personnel
	5.3	SMS documentation structure and content is maintained according to requirements, and appropriate action is taken to ensure correct procedures are followed to obtain a safety management certificate according to maritime regulatory requirements
	5.4	Appropriate measures are taken to ensure all personnel on board vessel are familiar with SMS documentation, that familiarisation arrangements for new crew members are carried out, and that all personnel apply SMS procedures relevant to their functions
	5.5	Correct procedures are followed to obtain a safety management certificate according to maritime regulatory requirements
6 Monitor and control vessel physical resources	6.1	Vessel inventory of plant, equipment and other physical resources is maintained accordance to company procedures, vessel survey requirements and established marine management practice
	6.2	Reports on status of vessel physical resources are prepared and submitted to relevant personnel within company and regulatory authorities according to company procedures, vessel survey requirements and established practice
7 Analyse and compile operational and voyage data	7.1	Operational and voyage data is collected and compiled according to company practice, regulatory requirements and established marine management practice
	7.2	Voyage report is prepared and validated according to company procedures, vessel survey requirements and established marine management practice
	7.3	Voyage report is submitted to designated personnel according to company procedures, vessel survey requirements and established practice

8 Provide leadership to officers and crew	8.1 Feedback and support are provided to crew on achievements and performance in their day-to-day work 8.2 Crew are treated fairly, equitably, effectively and honestly in matters related to their day-to-day work 8.3 Appropriate action is taken to prevent harassment and where it has occurred, harassment is dealt with promptly, effectively and fairly 8.4 Crew suggestions for work improvements are listened to, acted upon and credit for achievements is shared with crew 8.5 Good example is provided of a responsible, fair, sympathetic, equitable and diligent member of shipboard team
9 Allocate duties and maintain set standards of work on board vessel	9.1 Work requirements and crew competencies required for work duties are identified and clarified 9.2 Crew member competencies are assessed and confirmed, and duties are assigned to crew according to crew competencies and capabilities 9.3 Competency deficiencies in personnel are identified and remedial action is initiated through counselling and training 9.4 Crew members are advised of rostered duties and required performance standards are set in conjunction with crew members according to company procedures 9.5 Crew members are motivated to achieve set standards of work performance using appropriate methods 9.6 Performance of crew members is monitored as required using appropriate methods according to company procedures, performance assessments are discussed with relevant crew members and agreement is reached on appropriate action to be taken where performance is below set standards
10 Resolve conflict	10.1 Conflict situations are recognised and issues are clarified with personnel involved 10.2 Solutions to conflict are negotiated using appropriate mediation and conflict resolution techniques
11 Plan, organise, promote and evaluate shipboard training and	11.1 Workplace trainer and assessor requirements are identified and appropriate staff are trained and assigned as required 11.2 Work related training opportunities are planned and organised for crew according to identified needs and

assessment

company policy

- 11.3 Shipboard drills are organised according to regulations and company procedures
- 11.4 Assessment of crew members during and after training activities and shipboard drills is carried out to confirm required competencies and related knowledge have been acquired
- 11.5 Crew members are debriefed after training, drill and assessment activities using appropriate methods and efficacy of training, drill and assessment activities is evaluated based on feedback from participating crew members and other relevant evidence
- 11.6 Outcomes of evaluations of training and assessment are discussed with trainers and assessors, and appropriate action is taken to make required improvements
- 11.7 Reports on training and assessment are evaluated and resultant action is maintained and/or entered into vessel log as required

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.

- Vessel include one or
- vessels up to 500 GT (in the case of a Master or Chief Mate)
 - vessels up to 3000 GT (in the case of a Watchkeeper)

more of the following:

- vessels up to 3000 GT (in the case of a Master or Chief Mate) operating in near coastal operations

Vessel operations include one or more of the following:

- berthing and unberthing
- bridge operations
- cargo handling and care
- catering operations
- commercial operations (Australian and international regulations and conventions)
- deck operations and maintenance
- emergency and damage control operations
- engine room operations and maintenance
- mooring operations
- navigation
- passenger service operations
- personnel training
- pollution control operations
- radio operations
- safety/emergency drills
- slipping operations
- state port control

Laws and regulations pertaining to vessel operations and contingencies include one or more of the following:

- agency
- customs and quarantine
- deaths and disappearances
- drugs
- immigration
- marine pollution (Australian laws and IMO conventions)
- operational safety (Australian regulations and IMO conventions)
- security and anti-terrorism
- smuggling and piracy
- stowaways and refugees
- wrecks, salvage and towage

Vessel inventory of plant, equipment and other physical resources include one or more of the following:

- recording resources that are:
 - faulty
 - worn
 - damaged

Vessel physical resources include one or more of the following:

- accommodation equipment and facilities
- bridge equipment and resources
- catering equipment and facilities
- documents and certification
- engine room propulsion plant and equipment and related auxiliary systems
- navigation charts, marine publications, manufacturer manuals and other reference documentation
- radio equipment and facilities
- tools and maintenance equipment
- vessel deck equipment, fittings and related systems
- vessel structures and fittings

Training includes one or more of the following:

- distance learning for shipboard personnel
- onboard:
 - group training activities
 - individual instruction
- shipboard drills required by regulations or company policies
- shore-based training for shipboard personnel

Unit Mapping Information

This is a new unit. This unit is equivalent to MARD5001A Manage business and administration on vessels limited by tonnage or near coastal operations.

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 MARD001 Manage business and administration on vessels limited by tonnage or near coastal operations

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 on at least one occasion and include:

- analysing and compiling operational and voyage data, and preparing reports
- communicating effectively verbally and in writing
- complying with mandatory rules and regulations and International Maritime Organization (IMO) Conventions and Codes, including the relevant sections of Australian Maritime Safety Authority (AMSA) Marine Orders and ensuring applicable codes, guidelines and standards recommended by IMO, classification societies and maritime industry organisations are taken into account
- conducting management meetings
- coordinating an audit to maintain a safety management certificate
- developing effective planning document
- establishing and developing dynamic groups and teams on board a vessel
- following correct procedures for obtaining a safety management certificate
- implementing human resources management responsibilities
- interpreting and applying information on contracts of carriage, marine insurance, salvage and towage
 - national administrative procedures for accident investigation, and vessel and port security
 - procedures relating to customs, quarantine and immigration clearance
 - labour-related regulations
- investigating and arbitrating shipboard conflict
- investigating, analysing and compiling casualty data and preparing related reports
- leading officers and crew
- maintaining vessel security
- motivating shipboard personnel
- organising training evaluation processes
- planning, implementing and monitoring goals and performance requirements for vessel operations and emergencies
- planning, implementing and monitoring requirements related to:

- Master duties, obligations, commercial and legal responsibilities under national and international laws and conventions
- state port control
- vessel documentation, certification and survey
- planning, implementing and monitoring work health and safety (WHS)/occupational health and safety (OHS) procedures and practices
- planning, organising and promoting shipboard training programs
- promoting correct safety management on board vessels
- providing high quality reports
- recognising and interpreting non-verbal communication
- taking action promptly to report and/or rectify management problems according to established procedures
- using management skills effectively.

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:

- competency requirements for typical shipboard operations
- conflict resolution and mediation strategies and techniques
- contracts of carriage, marine insurance, salvage and towage
- established marine resource management procedures and practice
- equal employment policies and regulations
- general principles of integrated vessel and bridge management
- human resource management problems, and appropriate action and solutions
- legal issues relevant to Master responsibilities such as:
 - functions and responsibilities of Master, vessel owner and charterer in various types of charters and contracts of carriage
 - vessel owner obligation of reasonable dispatch
 - lay time, demurrage and dispatch
 - functions of a bill of lading
 - characteristics of a contract of carriage
 - international conventions relating to liability of a sea carrier
 - salvage and towage contracts
 - tort liability
 - legal principles of pilotage
 - insurance arrangements
 - vessel registration requirements
 - investigations and courts of marine inquiry
- maritime communication techniques, including barriers to effective communication and how to overcome them
- methods for:

- evaluating efficacy of shipboard training, drills and competency assessment
- motivating shipboard personnel
- identifying problems in services to other departments or in procedures and systems
- national administrative procedures for accident investigation, and vessel and port security
- national Training Packages and competency standards relevant to shipboard personnel
- principles of effective leadership and teamwork
- procedures for:
 - collecting, compiling, analysing and reporting on safety incidents and casualties on board a vessel, including format and characteristics of a good safety incident report
 - obtaining a safety management certificate and undergoing subsequent audits to maintain it
 - planning, implementing and monitoring goals and performance requirements for vessel operations and emergencies
 - relating to customs, quarantine and immigration clearance
- regulatory requirements for shipboard drills
- relevant:
 - industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements
 - maritime regulations
 - WHS/OHS and marine pollution control legislation, codes of practice, policies and procedures
- requirements related to:
 - state port control
 - vessel documentation, certification and survey
- role of vessel Master, including duties, obligations, and commercial and legal responsibilities under national and international laws and conventions
- techniques for:
 - evaluating and seeking alternatives for improvement of shipboard operational and emergency procedures and systems
 - setting of performance standards and evaluating performance of shipboard personnel
- training and competency assessment techniques and options suitable for shipboard personnel
- vessel safety management system (SMS) and:
 - its aims, objectives, advantages and disadvantages
 - general provisions for developing and monitoring vessel SMS
 - requirements of relevant maritime authorities for SMS.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARD002 Manage operations and maintenance on vessels limited by tonnage or near coastal operations

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage the operations of a commercial ocean-going vessel limited by tonnage or near coastal operations. It includes administration of vessel stability, cargo operations and planned maintenance system in compliance with Australian and international regulations and guidelines, protection of the marine environment and the safety of the vessel and people on board.

This unit applies to people who work in the maritime industry as Master or Chief Mate on a vessel of up to 500 gross tonnage (GT) or as a Watchkeeper on a vessel up to 3000 GT or as Master or Chief Mate on vessels up to 3000 GT operating in near coastal waters.

The unit is consistent with the relevant sections of STCW 95 and Marine Orders under the Australian Navigation Act 2012.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

D – Administration and Human Resources

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 Manage maintenance of vessel stability and safety parameters	1.1	Vessel dynamic stability is interpreted and analysed
	1.2	Vessel stability is correctly maintained in normal and adverse operational conditions
	1.3	Vessel safety parameters are correctly maintained within normal operational limits during cargo operations
2 Administer planning of cargo operations on vessel limited by tonnage or near coastal operations	2.1	Impact of cargo operations on vessel stability is managed
	2.2	Draft survey is conducted and used
	2.3	Appropriate procedures are administered for all cargo operations
3 Administer planned maintenance system	3.1	Vessel routine preventative maintenance plan is correctly interpreted and implemented
	3.2	Arrangements are made for maintenance activities to be carried out at required times
	3.3	Repairs to vessel hull or equipment and/or repair or replacement of equipment or components are organised according to procedures
4 Dock or slip vessel limited by tonnage or near coastal operations	4.1	Type of slipway, dock or vessel lifting facility is identified and suitability for type of hull assessed
	4.2	Hull data is correctly interpreted and recorded
	4.3	Appropriate plan is prepared for procedures to be taken onboard vessel prior to, during and on completion of proposed slipping or docking operations
	4.4	Cradle is correctly prepared prior to slipping of vessel
	4.5	Appropriate precautions are taken prior to slipping and refloating of vessel and when shoring/supporting vessel
	4.6	Vessel is correctly refloated after slipping and maintenance operations
5 Carry out inspection and maintenance procedures on vessel limited by tonnage or near coastal operations	5.1	Inspections of vessel hull, equipment and components are carried out according to company maintenance schedules and vessel manufacturer instructions
	5.2	Deterioration of vessel structure and fittings is identified and appropriate maintenance action is initiated according to work health and safety (WHS)/occupational health and safety (OHS) and pollution control requirements, company

		procedures and manufacturer instructions
	5.3	Lubricants, marine preservatives or finishes are applied correctly using appropriate application equipment according to WHS/OHS requirements, company procedures and manufacturer instructions
	5.4	Problems in application of lubricants, marine preservatives, finishes and other maintenance materials and chemicals are identified and reported, and appropriate remedial action is initiated
	5.5	Records of maintenance and lubrication work carried out are completed according to procedures
6	Administer correct selection and use of maintenance equipment and materials	
	6.1	Tools and equipment are correctly identified and used according to WHS/OHS requirements
	6.2	Maintenance materials are obtained
	6.3	Defective equipment and materials are identified and reported

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.

Vessel include one or more of the following:

- vessel up to 500 GT operating in international waters
- vessel up to 3000 GT operating in near coastal waters

Deterioration of vessel structure and fittings include one or more of the following:

- corrosion of hull fittings and equipment
- decay of timber surfaces
- osmosis and underwater blistering of painted and fibreglass finishes

Unit Mapping Information

This is a new unit. This unit is equivalent to MARD5002A Manage operations and maintenance on vessels limited by tonnage or near coastal operations.

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 MARD002 Manage operations and maintenance on vessels limited by tonnage or near coastal operations

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 on at least one occasion and include:

- carrying out operational management of vessel while underway, when berthed or moored, when slipped or in dry dock, during routine or unplanned events
- communicating effectively with other personnel when managing operations and maintenance of vessel limited by tonnage or near coastal operations
- communicating with multilingual crew using established techniques
- complying with relevant maritime regulations
- identifying problems that can occur when managing operations and maintenance of vessel and initiating appropriate action
- interpreting and following all safety management procedures and precautions when managing operations and maintenance of vessel limited by tonnage or near coastal operations
- interpreting and monitoring application procedures for managing operations and maintenance of vessel limited by tonnage or near coastal operations
- monitoring selection and use of publications, materials, tools and other equipment involved in managing operations and maintenance of vessel limited by tonnage or near coastal operations
- preparing appropriate reports on outcomes of inspection and maintenance activities
- providing leadership to other shipboard personnel when managing operations and maintenance of vessel limited by tonnage or near coastal operations
- reading and interpreting:
 - safety data sheets (SDS)/material safety data sheets (MSDS)
 - vessel and machinery specifications, gross and net tonnage, machinery design drawings, machine drawings, operational manuals, specifications, and electrical and control circuit diagrams
- recognising and adapting appropriately to cultural differences in the workplace, including modes of behaviour and interactions among crew and others
- taking appropriate precautions to prevent pollution of marine environment
- taking prompt action to report and/or rectify operational and maintenance problems.

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:

- applicable legislation, regulations and codes of practice
- documents and records, including:
 - relevant maritime regulations
 - company maintenance procedures
 - instructions of relevant maritime authorities related to operations and maintenance of vessels
 - maintenance schedules and records
 - vessel and equipment manufacturer instructions, specifications and recommended procedures
 - stability and cargo documents pertaining to vessel limited by tonnage or near coastal operations
- maintenance records that must be kept on vessel to meet requirements of company and regulatory authorities
- nature and causes of corrosion of marine surfaces and structures, and available methods for its control
- operational management and maintenance:
 - routine maintenance inspections
 - administering repairs of minor faults and imperfections in painted surfaces and managing preparation of marine surfaces prior to application of prescribed marine coating
 - identifying deterioration of vessel structure and fittings
 - identifying faulty equipment or fittings and arranging for repair or replacement
 - managing application of lubricants to moving parts of vessel equipment
 - managing vessel stability both normal and adverse operational conditions
 - managing vessel cargo operation procedures
- principal features of structure of vessel, with a basic understanding of properties and application of materials used in vessel construction
- procedures for:
 - checking and inspecting vessel stability during a range of operational conditions, including loading and discharging of cargo as part of routine procedures to ensure compliance with company requirements and established safety rules and regulations
 - initiating and coordinating repair and/or replacement procedures on board vessels
- publications, tools and equipment required for operational management and maintenance:
 - cargo and stability calculators and publications
 - electric and pneumatic power tools such as grinders, sanders, drills and hand tools, including chipping hammers and scrapers
 - marine preservative finish application equipment such as brushes, spay guns, rollers and greasing and lubrication tools
 - rinsing and storing equipment

- protective clothing and equipment (eye and ear protection, safety boots, dust and fume masks)
- relevant sections of applicable maritime regulations
- relevant work health and safety (WHS)/occupational health and safety (OHS) and pollution control legislation and policies
- safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations
- slipping and docking procedures suitable for various types of hull forms, including communication techniques used
- typical problems relating to slipping and maintaining vessels and appropriate action and solutions.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARE001 Communicate effectively when performing engineering duties

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to communicate effectively when performing engineering duties on board a commercial vessel and includes communicating with others; reading and interpreting engineering publications, specifications, instructions and other documents; reading and interpreting equipment performance indications; using available tools to communicate between the bridge, engine control room and main engine room; and using a computer to enter and retrieve engineering information.

This unit applies to the work of a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW and an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

E - Communication

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 Apply information to engineering	1.1 Relevant engineering publications and other documentation are identified and accessed

watchkeeping duties	1.2	Required information is extracted from relevant engineering publications and other documentation and is appropriately applied to work activities according to established marine engineering practice
	1.3	Information in relevant engineering publications and other documentation used in day-to-day work is applied to work activities
	1.4	Engineering specifications and drawings are correctly read and interpreted, and information is applied according to established marine engineering practice
2 Apply engineering information	2.1	Readings on performance indicators are correctly made and interpreted
	2.2	Engineering information, procedures, instructions and directions are obtained, interpreted and applied
	2.3	Standard drawing symbols, appropriate instrumentation and process control terms are correctly used in relation to actions and functions of marine equipment and plant
	2.4	Engineering drawings and control loops are correctly sketched as required
	2.5	Engineering reports, running sheets and other engineering documentation relevant to the performance of engineering duties are correctly and accurately completed
3 Communicate between bridge, engine control room and main engine room	3.1	Available tools are correctly used to communicate between bridge, engine control room and main engine room
	3.2	Appropriate records of engineering communications are completed according to organisational procedures and regulatory requirements
4 Communicate with officers, crew and others	4.1	Clear and precise communication is used and established communication practices are followed
	4.2	Communication misunderstandings are avoided using appropriate confirmation techniques and established communication practices
	4.3	Messages concerning vessel safety and operations are received, read, clarified as required, correctly interpreted and applied to engineering activities
	4.4	Appropriate techniques are used when communicating with

multilingual crew to ensure communication is effective and messages are clearly understood

- 4.5 Non-verbal communication is appropriately used when working and communicating with others
- 4.6 Feedback, instruction and training on work performance is effectively provided to engine room crew according to vessel procedures and established engineering practice

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.

Relevant engineering publications and other documentation include one or more of the following:

- anti pollution and environmental protection regulations and procedures, including relevant sections of the International Convention for the Prevention of Pollution from Ships (MARPOL)
- instructions of relevant maritime authorities and classification societies concerning shipboard machinery operations, maintenance and repair
- International Safety Management (ISM) Code safety management system plans, procedures, checklists and instructions
- machinery and vessel manufacturer specifications, instructions and recommended procedures
- marine engineering publications and manuals
- relevant sections of national and international regulations, International Maritime Organization (IMO) Conventions and

Codes, including Australian Maritime Safety Authority (AMSA) Marine Orders and class society rules dealing with shipboard machinery maintenance and repair

- operational and maintenance logs, running sheets and records, including computer databases of running information and maintenance records
- vessel and organisational planned operational and maintenance procedures and instructions
- vessel safety and emergency contingency plans and procedures, including relevant sections of the International Convention for the Safety of Life at Sea (SOLAS)
- vessel survey as it relates to shipboard plant, equipment and machinery

Performance indicators include one or more of the following:

- computer screens
- gauges
- instrumentation

Available tools include one or more of the following:

- alarms
- hand held radios
- internal communication systems

Unit Mapping Information

This is a new unit. This unit is equivalent to MARE5001A Communicate effectively when performing engineering duties.

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 MARE001 Communicate effectively when performing engineering duties

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 on at least one occasion and include:

- assessing own work outcomes and maintain knowledge of current codes, standards, regulations and industry practices
- communicating effectively verbally and in writing
- identifying and interpreting numerical and graphical information in marine engineering publications
- identifying, collating and processing information required to prepare verbal and written reports
- imparting knowledge and ideas as required through oral, written and visual means
- interpreting documentation related to marine engineering operations
- maintaining effective records
- reading and interpreting written information needed to perform basic marine engineering tasks
- resolving misunderstandings in written and verbal communication
- using computer and relevant equipment to enter, access and retrieve engineering information
- using established marine engineering vocabulary as required.

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:

- established engineering practice for the operation, checking, maintenance and repair of marine plant, machinery, equipment and systems
- established written, verbal and non-verbal marine engineering communication practices
- marine engineering communication techniques, including barriers to effective communication and how to overcome them
- national and international regulations, International Maritime Organization (IMO) Conventions and Codes, including Australian Maritime Safety Authority (AMSA) Marine Orders applicable to the operation, maintenance and repair of plant, machinery and equipment on vessels of unlimited propulsion power
- principles of effective communication

- protocols and procedures for communicating with others on board vessels
- relevant industrial award requirements as they relate to shipboard engineering personnel responsibilities, obligations and entitlements
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation, codes of practice, policies and procedures
- standard nautical vocabulary as described in IMO Standard Marine Communication Phrases
- techniques for communicating effectively with a multilingual crew
- tools typically available for communication between bridge, engine control room and main engine room
- typical communication problems and appropriate action and solutions
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF001 Apply basic survival skills in the event of vessel abandonment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply basic survival skills in the event of vessel abandonment.

This unit applies to deck and engine workers working in the maritime industry on vessels up to 80 metres. They could be working independently or as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Prepare to abandon vessel

- 1.1 Nature of emergency is determined to minimise potential dangers and threats
- 1.2 Muster and abandon vessel signals are responded to according to vessel safety procedures
- 1.3 Survival equipment is organised to maximise chances of survival

- 1.4 Emergency position indicating radio beacon (EPIRB) is operated to transmit distress signal
 - 1.5 Distress calls are made using radio equipment on distress call frequency, if time allows, to communicate the nature of the emergency
 - 1.6 Others are assisted to maximise their chances of survival
- 2 Determine operational safety requirements**
 - 2.1 Relevant maritime legislation is identified, accessed and reviewed
 - 2.2 Safety requirements for a range of near coastal vessels are identified, accessed and reviewed
 - 2.3 Lifesaving and survival equipment required on board a near coastal vessel are accurately identified
 - 2.4 Lifesaving equipment on board is checked and confirmed as serviceable
 - 2.5 Lifesaving and survival equipment certificates and documentation are checked for validity
 - 2.6 Vessel safety management systems (SMS) and plans are located, interpreted and applied
- 3 Practise survival techniques**
 - 3.1 Typical emergency alarms and types of alarm systems are accurately identified
 - 3.2 Need to abandon vessel is determined according to established safety practice and procedures
 - 3.3 In-water survival techniques are implemented according to established safety practice and procedures
 - 3.4 Threats to survival are identified and treatment options are outlined
- 4 Apply survival techniques**
 - 4.1 Lookout for vessels and aircraft is maintained and distress signals are released on sighting
 - 4.2 During an emergency, work is carried out collaboratively with other shipboard personnel and passengers as required
 - 4.3 During emergency and survival situations, appropriate communication skills and techniques are implemented
 - 4.4 Instructions given by rescue personnel to safely access

- rescue craft are followed
- | | |
|--|---|
| 5 Operate lifesaving and survival equipment | <p>5.1 Range of pyrotechnic and distress signals are operated according to established safety practice and procedures</p> <p>5.2 Survival equipment is operated according to instructions and accepted survival practice</p> <p>5.3 Survival radio equipment is operated according to manufacturer instructions and regulatory protocols</p> <p>5.4 Lifejackets and other lifesaving equipment are operated and used according to instructions</p> |
| 6 Participate in abandon vessel drills | <p>6.1 Regulatory requirements and company procedures for musters and drills are identified and implemented</p> <p>6.2 Actions required for a range of muster signals are correctly identified</p> <p>6.3 Action is taken promptly to address problems that may arise when following vessel abandonment procedures</p> <p>6.4 Hazards are identified that may occur when abandoning vessel risks are minimised according to SMS, and established safety practice and procedures</p> <p>6.5 Information relevant to use of lifesaving equipment is accessed and correctly interpreted</p> <p>6.6 Range of emergencies that may lead to vessel abandonment are outlined</p> |

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.

Survival equipment includes one or more of the following:

- EPIRBs
- flares
- immersion suit
- life jackets
- person overboard combination light and smoke float
- search and rescue transponders (SARTs)
- survival craft

Radio equipment includes one of the following:

- high frequency (HF)
- very high frequency (VHF)

Lifesaving and survival equipment include one or more of the following :

- immersion suit
- lifebuoy
- personal floatation devices

Certificates and documentation include one or more of the following:

- instructions for use of lifesaving equipment
- pyrotechnic expiry dates
- record of inspection of equipment

Emergency alarms and types of alarm systems include one or more of the following:

- electronic alarms
- muster and abandon vessel alarms
- verbal communication

In-water survival techniques include one or more of the following:

- floating with or without a lifejacket
- heat loss techniques
- swimming with a lifejacket

Threats to survival include one or more of the

- dehydration
- hypothermia
- ingestion of seawater

following:

Rescue craft include one of the following:

- another vessel
- helicopter

Pyrotechnic and distress signals include one of the following:

- orange smoke flare
- red handheld flare

Risks and hazards include one or more of the following:

- expired pyrotechnics
- inaccessible lifejackets
- no defined abandon ship procedures established
- poorly maintained equipment

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF1001A Apply basic survival skills in the event of vessel abandonment.

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 MARF001 Apply basic survival skills in the event of vessel abandonment

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 on at least one occasion and include:

- collecting, managing and interpreting information on the use of lifesaving equipment and procedures to be followed when order to abandon vessel is given
- communicating effectively with other personnel and passengers during simulated and actual abandon vessel musters and emergencies
- determining type and extent of emergency and appropriate survival action to be taken
- donning a lifejacket in water and:
 - ensuring behaviour reflects statutory requirements pertaining to lifesaving appliances
 - locating survivors in simulated darkness
 - swimming in a lifejacket for a minimum of 50 metres
 - towing with a life jacket for a minimum of 25 metres
 - remaining afloat without a lifejacket for at least 10 minutes
 - assisting a survivor to don a lifejacket
 - maintaining a group huddle for at least 10 minutes
 - swimming in a group congo line for a minimum of 50 metres
 - holding heat escape lessening posture for at least 10 minutes
- donning various lifejacket and other lifesaving apparel
- identifying signs of hypothermia and providing appropriate treatment
- operating radio equipment
- planning timing and sequence of individual survival actions to be appropriate to prevailing circumstances and conditions of emergency, and minimising potential dangers and threats to other survivors
- reading and interpreting instructions on emergency procedures, safety management systems and plans, and using of lifesaving and survival equipment
- recognising and interpreting muster signals appropriately for indicated emergency
- swimming in a lifejacket

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:

- appropriate techniques for:
 - first aid
 - maritime communication
 - survival
 - survival at sea
 - survival with a swamped, semi submerged tender or dingy
 - using survival equipment
- action to be taken in an emergency situation
- construction, outfit and particular characteristics of various types of applicable survival equipment
- emergency muster and abandon vessel signals
- emergencies that may lead to vessel abandonment
- established safety practice and procedures
- importance of being ready for any shipboard emergency including using lifesaving equipment
- initial actions for survival on vessel abandonment
- location of:
 - lifesaving appliances on a vessel
 - survival equipment on vessel
- maintenance of lifesaving appliances
- personal protective equipment (PPE)
 - purpose
 - use
- procedures for:
 - abandoning vessel
 - correctly operating and using lifesaving appliances and PPE on board vessels and survival craft, and specifically donning a lifejacket, using a lifejacket light and whistle, using handheld pyrotechnics
 - emergency response on board vessels, including abandoning vessel
- regulatory requirements and company procedures for musters and drills
- relevant manufacturer guidelines relating to operating and using survival equipment, including instructions on equipment capability and limitations
- relevant maritime regulations related to required survival equipment on a vessel
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies including SMS, plans, processes and techniques
- standard safety symbols
- steps to be taken after collision, grounding or other marine casualty and resulting hull damage
- symptoms of hypothermia, its prevention and treatment and related use of protective covers and garments
- threats to survival after abandoning vessel and:
 - appropriate strategies for countering these threats

- how to minimise dangers
- use of distress signals and penalty for misuse
- value of training and emergency drills for enhancing chances of survival at sea
- ways of maximising detect-ability using pyrotechnic distress signals, portable high frequency (VHF) radios, satellite Emergency position indicating radio beacons (EPIRBs).

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF002 Follow procedures to minimise and fight fires on board a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply defined policies and procedures when carrying out fire minimisation procedures and fighting a fire on board a vessel.

This unit applies to deck and engine workers working in the maritime industry on vessels up to 80 metres. They could be working independently or as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Carry out fire minimisation procedures

- 1.1 Fire hazards and risks on board vessel are identified and reported to designated personnel according to workplace procedures
- 1.2 Workplace procedures and work instructions for controlling fire risks are followed
- 1.3 Firefighting equipment is regularly checked and appropriate

- action is taken to ensure it is operational
- 1.4 Participation in fire drills and musters is undertaken to ensure readiness for fire emergencies
- 2 Follow instructions during response to a fire emergency**
- 2.1 Location and class of fire are identified and alarm is raised and/or responded to according to workplace procedures
- 2.2 Appropriate protective clothing and equipment requirements are made ready
- 2.3 Instructions to contain the spread of fire and smoke are acted upon
- 2.4 Fire is attacked using appropriate method, firefighting equipment and extinguishing media/agent according to instructions
- 2.5 Collaboration and communication is maintained with others to support the safety and efficiency of the firefighting operation
- 3 Support post-fire operations**
- 3.1 Fire watch is carried out as instructed to prevent further outbreak
- 3.2 Equipment is restored to operational condition according to workplace instructions
- 3.3 Assistance is provided to preserve fire scene prior to investigation, as required
- 3.4 Information relevant for fire incident debrief is provided

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.

Fire hazards and risks must include:

- cargo
- clothing
- cooking oils
- cordage
- electrical arcing
- fuels and lubricants
- furnishings
- paints
- poor housekeeping
- poor work practices
- smoking
- spontaneous combustion

Firefighting equipment includes one or more of the following:

- fire blankets
- hydrant hoses and nozzles
- international shore connection
- portable extinguishers
- pumps

Classes of fire must include:

- A – Carbonaceous solids
- B – Flammable liquids
- C – Flammable gases
- E – Electrically energised equipments
- F – Cooking fats or oils

Protective clothing and equipment must include:

- foot protection
- hand protection
- radiant heat protection

Extinguishing media/agent must include:

- extinguishing powder
- foam
- gaseous extinguishing agents
- water

Restoring equipment must include:

- cleaning
- servicing (as required)
- re-stowing

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF1002A Follow procedures to minimise and fight fires on board a 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 MARF002 Follow procedures to minimise and fight fires on board a 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 on at least one occasion and include:

- applying extinguishing media to a fire
- communicating and working collaboratively as a member of a team in a firefighting operation
- correctly using vessel closure and shutdown systems
- conducting effective boundary cooling
- operating a fire extinguisher
- using a fire blanket to extinguish a fire
- using water spray as an effective firefighting agent.

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:

- alarms and signals during onboard emergencies
- chemistry of fire and its relationship to flash point, vapour density, auto ignition temperature and spontaneous combustion
- classes of fire applicable to Australian and New Zealand standards
- detection and suppression systems including fixed firefighting systems
- extinguishing media including firefighting foams
- firefighting tactics, techniques and procedures including team dynamics
- fire tetrahedron
- hazards and threats to life or health during onboard firefighting operations
- methods of heat transfer
- onboard emergency response organisation and procedures
- portable fire extinguishers – colour codes and suitability for class of fire
- principles underlying spread of fire on a vessel
- principles and methods of extinguishment of each class of fire
- safe working practices
- types of fire detection, firefighting equipment and systems used on vessels, their features, principles of operation, procedures for their use and problems that can occur

- ventilation procedures
- vessel construction as it relates to fire prevention/protection
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF003 Follow vessel security procedures

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to recognise and report security threats.

This unit applies to deck and engine workers working in the maritime industry requiring a Certificate of Safety Training.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F - Operational Quality and Safety

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 Contribute to enhancing security through heightened awareness

1.1	Legislative and organisational requirements related to maintaining security of a vessel are identified and followed
1.2	Organisational security procedures are identified and followed
1.3	Duty of care requirements are ascertained and complied with
1.4	Need for and methods of, maintaining security awareness and vigilance, are appreciated

	1.5	Own role and responsibilities are recognised
	1.6	Role of designated personnel for security response is ascertained
	1.7	Work health and safety (WHS)/occupational health and safety (OHS) requirements are recognised and complied with
2 Recognise potential security threats	2.1	Potential security threats relating to a vessel are identified
	2.2	Procedures for monitoring security of a vessel are recognised
	2.3	Factors with increased security risk are identified
	2.4	Types and purpose of security equipment are explained
	2.5	Emergency and evacuation procedures are identified and implemented
	2.6	Appropriate actions for maintaining security and safety of self, others and the vessel are identified and followed
3 Comply with reporting processes	3.1	Organisational procedures for reporting security risks and incidents are accessed and followed
	3.2	Chain of command of designated personnel is ascertained
	3.3	Communication modes are recognised and used appropriately

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.

Legislative requirements include one or more of the following:	• applicable crime Acts and codes of practice • award and enterprise agreements • general duty of care responsibilities • maritime industry codes of practice • maritime transport Acts and regulations
Designated personnel include one or more of the following:	• Company Security Officer • emergency services • First Aid Officer • Master • Port Security Officer • Ship Security Officer • WHS/OHS representative
Security threats include one or more of the following:	• injury to persons • persons carrying weapons • persons causing a public nuisance • persons demonstrating suspicious behaviour • persons under the influence of intoxicating substances • persons with criminal intent • piracy and armed robbery • terrorism • theft • unattended packages, goods, baggage or cargo • unattended vehicles in areas not designated for parking • vandalism • violence or physical threats
Security equipment includes one or more of the following:	• alarms • locked and secure areas • mirrors • surveillance equipment
Appropriate action includes one or more of	• access control to the vessel • monitoring restricted areas

the following:

Procedures for reporting security risks include one or more of the following:

- completing documentation such as logs and activity reports
- completing police reports
- contacting designated personnel
- requesting security assistance

Communication modes include one or more of the following:

- alarms
- call codes and signs
- hand signals
- megaphone
- mobile phone
- public address system
- telephone
- two-way radio
- verbal communication

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF1003A Follow vessel security procedures.

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 MARF003 Follow vessel security procedures

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 on at least one occasion and include:

- applying basic security legislative requirements applicable to a vessel
- applying procedures for monitoring security in a marine environment
- being aware of one's surroundings and changes to these surroundings
- identifying a range of security threats and risks relevant to a vessel
- observing chain of command and communication channels
- operating security equipment
- recognising potential security threats
- reporting identified security threats and risks in a marine environment and providing appropriate level of detail in these reports.

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:

- applicable legislation relevant to the marine environment and own work role
- applicable WHS/OHS requirements
- communication chain of command
- communication modes and security equipment and systems relevant to the marine environment
- duty of care requirements of self and others
- enabling recognition of potential security threats including elements related to piracy and armed robbery
- enabling recognition of weapons, dangerous substances and devices and awareness of the damage they can cause
- general procedures for emergency, evacuation and first aid response
- handling security related information and security related communications
- international marine security policy and responsibilities of governments, organisations and individuals
- maritime security levels and their impact on security measures and procedures aboard ship and in port facilities

- maritime security terms and definitions including elements relating to piracy and armed robbery
- need for and methods of maintaining security awareness and vigilance
- reporting procedures
- security related contingency plans
- techniques used to circumvent security measures
- training, drill and exercise requirements under relevant conventions, codes and International Maritime Organization (IMO) circulars including those relevant for anti-piracy and anti-armed robbery
- WHS/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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF004 Meet work health and safety requirements

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to follow defined work health and safety (WHS)/occupational health and safety (OHS) policies and procedures relating to the work being undertaken in order to ensure own safety and that of others on board a vessel.

This unit applies to deck and engine workers working in the maritime industry on vessels up to 80 metres. They could be working independently or as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Recognise safety management system requirements

- 1.1 WHS/OHS responsibilities and duties are identified and accountability processes are outlined
- 1.2 WHS/OHS policies and procedures are accessed and reviewed, and clarification is sought where necessary
- 1.3 Implications of changes to the safety management system (SMS) are identified and addressed

	1.4	Records are accurately completed
2 Work safely	2.1	Established safety procedures are followed when conducting work
	2.2	Work for which personal protective clothing and/or equipment is required is identified,
	2.3	Personal protective clothing and/or equipment is used, maintained and stored according to workplace procedures
	2.4	Safety checks on all equipment and machinery are undertaken before operation according to workplace procedures
	2.5	Hazardous chemicals are identified and handled according to workplace procedures
	2.6	Safe manual handling techniques are used when conducting work
	2.7	Worker/employee responsibilities prescribed in WHS/OHS legislation are recognised and carried out
3 Follow workplace procedures for hazard identification, risk assessment and risk control	3.1	Hazards in the workplace are recognised and reported to designated personnel according to workplace procedures
	3.2	Assessment of risks associated with identified hazards is made according to workplace procedures
	3.3	Workplace procedures and work instructions for controlling risks are followed
	3.4	Risks to fellow workers and other people are recognised and action is taken to eliminate or reduce them
4 Participate effectively in WHS/OHS consultation processes	4.1	WHS/OHS issues are raised with designated personnel according to workplace procedures
	4.2	Contributions are made to workplace meetings, inspections and other WHS/OHS activities
	4.3	Ideas are provided to control the level of risk associated with work tasks
5 Follow emergency procedures	5.1	Emergency incidents are identified and reported
	5.2	Emergency procedures are followed in responding to emergency incidents

- 5.3 Emergency equipment is used in responding to emergency incidents
- 5.4 Appropriate personnel are notified according to workplace 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.

Safety procedures must include:

- instructions on how a workplace activity should be carried out, by whom and when include:
 - accident and incident reporting
 - electrical safety
 - emergency procedures
 - health and hygiene
 - isolation
 - manual handling
 - noise and vibration
 - permit to work
 - plant and equipment
 - rescue procedures
 - use and storage of hazardous substances
 - use of personal protective equipment
 - use of safety and flotation devices
 - vessel housekeeping

	• work in rough weather • working with the elements
Personal protective clothing and equipment include one or more of the following:	• aprons • breathing apparatus • eye protectors • gloves • harnesses • hats • hearing protectors • helmets • overalls • personal flotation devices • personal locator beacons • safety lines • shoes • spats
Hazardous chemicals include one or more of the following:	• battery acid • cleaning fluids • fuel • gas • oils and lubricants • paint • thinners
Safe manual handling techniques include one or more of the following:	• bending • lifting • loading materials • moving • pulling • pushing • repetitive tasks • storing materials at heights • up-ending materials
Worker/employee responsibilities include one or more of the following:	• accepting responsibility for protection of health and safety of others through avoidance of personal action that will put others at risk • cooperating with employer/supervisor in any action taken to comply with WHS/OHS legislation • taking reasonable care for own health and safety
Hazards include one or more of the following:	• contact with chemicals and hazardous substances • contaminants • contact with electricity • contact with plant and marine life

- dangerous organisms
 - equipment operation and maintenance
 - falls, trips and slips
 - exposure to heat, cold and water
 - hitting or being hit by stationary or moving objects
 - immersion in water without a personal flotation device (PFD)
 - ladders
 - manual handling
 - noise
 - poor housekeeping and lack of deck space
 - repetitive movements and awkward postures
 - smoking and alcohol
 - unventilated holds
 - weather and water conditions
 - working in confined spaces
 - working with inappropriate clothing
 - working with knives
- Designated personnel include one or more of the following:
- master of the vessel
 - supervisors, managers and team leaders
 - workplace WHS/OHS personnel
 - other persons authorised or nominated by the workplace to perform, approve, inspect or direct specified work
- Emergency incidents include one or more of the following:
- beaching with and without heavy surf
 - chemical spills
 - collisions
 - disabled vessel
 - electrocution
 - falling or being dragged overboard
 - fire
 - flood
 - grounding
 - hull damage
 - immersion in water
 - injuries associated with dangerous organisms (such as bites, stings, poisoning)
 - injuries associated with machines, vehicles, vessels, diving
 - loss of rudder
 - lost or fouled propeller
 - rescue activities
 - rough weather and heavy seas
 - vessel capsize

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF1005A Meet work health and safety requirements.

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 MARF004 Meet work health and safety requirements

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 on at least one occasion and include:

- accessing workplace information on health and safety policies and procedures
- applying problem solving skills to investigate and identify causes of WHS/OHS incidents
- applying person overboard procedures for recovery
- contributing to the review and development of advice on appropriate WHS/OHS procedures
- demonstrating safe work practices
- identifying and responding to typical emergency situations
- identifying isolation points for equipment and following workplace procedures for lock out or tag out of equipment as required
- identifying WHS/OHS hazards related to work responsibilities and taking required action to remove or control hazards
- maintaining housekeeping standards in work area
- rendering assistance to others in distress
- reporting WHS/OHS information according to workplace procedures
- selecting, fitting and using appropriate personal protective clothing and equipment
- using consultation processes to consult others on WHS/OHS issues
- working as part of a team.

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:

- action to be taken:
 - in an emergency situation
 - in the event of loss of rudder
 - in the event of lost or fouled propeller
 - when vessel is completely disabled
- application of concepts relating to hazard identification, risk assessment and control options
- communication systems and consultation arrangements

- difference between hazards (source of potential harm) and risks (chance of something occurring that will result in injury or damage)
- disposition of persons onboard to ensure satisfactory stability and trim
- emergency and evacuation procedures
- impact of housekeeping on safety
- location of advice on WHS/OHS issues including documents such as procedures and safety data sheets (SDS)/material safety data sheets (MSDS)
- obligations and duties towards all persons onboard
- procedures and responsibilities for investigating WHS/OHS incidents and assessing risk
- procedures for working in confined spaces
- purpose and procedure for collecting and reporting WHS/OHS information
- safe work procedures relating to work responsibilities
- SMS
- steps to be taken after collision, grounding or other marine casualty and resulting hull damage
- storage requirements for hazardous goods used in work area
- typical hazards related to work responsibilities
- use, care and storage of personal protective clothing and equipment
- use of distress signals and penalty for misuse
- WHS/OHS legislation, regulations, codes of practice and organisational policies and procedures associated with work responsibilities.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF005 Survive at sea using survival craft

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to survive at sea using survival craft.

This unit applies to deck and engine workers working in the maritime industry on vessels up to 80 metres. They could be working independently or as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Prepare to abandon vessel

- 1.1 Nature of emergency is determined to minimise potential dangers and threats
- 1.2 Muster and abandon vessel signals are responded to according to vessel safety procedures
- 1.3 Survival equipment is organised to maximise chances of survival
- 1.4 Emergency position indicating radio beacon (EPIRB) is

- operated to transmit distress signal
- 1.5 Distress calls are made using radio equipment
- 1.6 Others are assisted to maximise their chances of survival
- 1.7 Prevailing circumstances and emergency conditions are used as the basis for timing and sequencing individual survival actions, and potential dangers and threats to other survivors are minimised
- 2 Operate lifesaving and survival equipment**
 - 2.1 Location and accessibility of lifesaving and survival equipment is established
 - 2.2 Survival craft is launched in a timely and effective manner
 - 2.3 Survival equipment is operated according to instructions and accepted survival practice
 - 2.4 Survival radio equipment is operated according to manufacturer instructions and regulatory protocols
 - 2.5 Lifejacket and other lifesaving clothing are correctly used according to instructions
- 3 Abandon vessel safely**
 - 3.1 Need to abandon vessel is established according to safety management system (SMS) or plan
 - 3.2 Survival craft is launched according to instructions
 - 3.3 Survival craft is checked to ensure it is safe to board
 - 3.4 Survival craft is boarded observing safety of other survivors
 - 3.5 Survival craft is released from abandoned vessel
 - 3.6 Exposure cover is deployed on survival craft according to accepted survival practice and manufacturer instructions
- 4 Apply survival techniques**
 - 4.1 Survival craft is checked for seaworthiness
 - 4.2 Sea anchors and drogues are deployed according to accepted nautical practice
 - 4.3 Occupants are checked for signs of hypothermia or other injuries and first aid is applied as required
 - 4.4 Water and food is rationed
 - 4.5 Lookout for vessels and aircraft in vicinity is maintained

and distress signals are released on sighting

- 4.6 Instructions given by rescue personnel are followed to safely access rescue craft

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.

Survival equipment includes one or more of the following:

- EPIRBs
- flares
- immersion suit
- life jackets
- person overboard combination light and smoke float
- search and rescue transponders (SARTs)
- survival craft

Radio equipment includes one of the following:

- HF
- VHF

Survival craft includes one or more of the following:

- inflatable life raft
- life boat
- life buoy

Rescue craft includes one of the following:

- another vessel
- helicopter

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF1006A Survive at sea using survival craft.

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 MARF005 Survive at sea using survival craft

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 on at least one occasion and include:

- applying appropriate handling strategies to manoeuvre survival craft in rough weather and sea conditions
- boarding a life raft while wearing a lifejacket and assisting others to board
- collecting, managing and interpreting information on the use of lifesaving equipment
- determining type and extent of emergency
- freeing a survival craft of obstructions
- jumping safely from a height into the water according to established survival practice
- launching survival craft
- operating radio equipment
- participating in training, musters and emergency drills
- performing calculations to ration food and water
- reading and interpreting instructions for emergency procedures and for use of lifesaving and survival equipment
- recognising and interpreting muster signals
- righting an inverted life raft while wearing a lifejacket according to established survival practice
- swimming while wearing a lifejacket and floating without a lifejacket according to established survival practice.

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:

- action to be taken in emergency situations
- emergency muster and abandon vessel signals
- equipment found in survival craft, its function and procedures for correct operation
- established survival practice
- first aid techniques
- importance of being ready for shipboard emergencies
- International Convention for the Safety of Life at Sea (SOLAS) regulations

- location of survival equipment on vessel
- maintenance of lifesaving appliances
- personal protective equipment (PPE):
 - purpose
 - use
- procedures for abandoning vessel
- relevant maritime regulations:
 - relating to required survival equipment on a vessel
 - dealing with survival at sea following vessel abandonment
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- steps to be taken after collision, grounding or other marine casualty and resulting hull damage
- standard safety symbols
- survival at sea techniques
- survival craft:
 - construction
 - outfit
 - particular characteristics of different types
- techniques for using survival equipment
- time required to make distress calls safely
- threats to survival on vessel abandonment and appropriate strategies for countering these threats
- use of distress signals and penalty for misuse.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARF006 Observe personal safety and social responsibility

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to contribute to the safety management system processes where there is responsibility for own work outputs.

This unit applies to people working in the maritime industry requiring a Certificate of Safety Training.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F - Operational Quality and Safety

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 conduct work safely

1.1	Individual rights and responsibilities on board a vessel are interpreted and fulfilled
1.2	Work is planned in accordance with work health and safety (WHS)/occupational health and safety (OHS) legislation and safety management system requirements
1.3	Work is carried out according to established performance standards

	1.4	Hazards are identified as part of work planning and work processes
	1.5	Identified hazards are addressed prior to starting work
	1.6	Inadequacies in control measures are reported according to the safety management system
	1.7	Incidents and injuries are reported according to organisational procedures
	1.8	WHS/OHS housekeeping is undertaken in own work area
2		Contribute to WHS/OHS participation processes
	2.1	WHS/OHS representatives and committees are supported to undertake their roles and responsibilities
	2.2	WHS/OHS issues are raised according to organisational procedures
	2.3	Contributions to WHS/OHS meetings, vessel inspections or other consultative activities are provided in a constructive manner to improve safety
3		Contribute to hazard identification, risk assessment and risk control activities
	3.1	Vessel is checked for hazards using itemised checklists according to the safety management system
	3.2	Identified hazards and inadequacies in risk controls are reported according to the safety management system
	3.3	Contributions to risk assessments are made
	3.4	Input is provided to development and implementation of control measures, with reference to the hierarchy of control
	3.5	Where relevant, procedures and precautions for entry into pump room, fuel tanks or other confined spaces on a vessel are correctly followed
4		Participate in controlling WHS/OHS emergency situations
	4.1	Scale of the emergency situation is correctly recognised
	4.2	Prompt, accurate and clear information is given on raising alarm
	4.3	Initial action is taken to control/confine emergency according to organisational procedures, taking account of the nature and scope of the emergency
	4.4	Emergency response procedures are implemented
5		Complete
	5.1	WHS/OHS records for vessel are correctly completed

WHS/OHS records

- 5.2 Legal requirements for the maintenance of records of occupational injury and disease are followed

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.

Individual rights and responsibilities include one or more of the following:

- avoiding and preventing harassment of others
- avoiding drug and alcohol abuse on board vessel
- implementing appropriate precautions to avoid contributing to the spread of the human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) and other communicable diseases
- maintaining appropriate standards of hygiene and cleanliness
- providing a good example to others as a responsible, fair, sympathetic, and equitable member of the shipboard team
- respecting the religious and cultural habits of crew members

Hazards include one or more of the following:

- contact with chemicals and hazardous substances
- contaminants
- contact with electricity
- contact with plant and marine life
- dangerous organisms
- equipment operation and maintenance
- falls, trips and slips
- exposure to heat, cold and water

- hitting or being hit by stationary or moving objects
- immersion in water without a personal flotation device (PFD)
- ladders
- manual handling
- noise
- poor housekeeping and lack of deck space
- repetitive movements and awkward postures
- smoking and alcohol
- unventilated holds
- weather and water conditions
- working in confined spaces
- working with inappropriate clothing
- working with knives

Emergency situations include one or more of the following:

- beaching with and without heavy surf
- chemical spills
- collisions
- disabled vessel
- electrocution
- falling or being dragged overboard
- fire
- flood
- grounding
- hull damage
- immersion in water
- injuries associated with dangerous organisms (such as bites, stings, poisoning)
- injuries associated with machines, vehicles, vessels, diving
- loss of rudder
- lost or fouled propeller
- rescue activities
- rough weather and heavy seas
- vessel capsize

WHS/OHS records include one or more of the following:

- accident reports
- incident reports
- injury reports
- hazard reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF3002A Observe personal safety and social responsibility.

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 MARF006 Observe personal safety and social responsibility

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 on at least one occasion and include:

- applying the hierarchy of control (the preferred order of risk control measures from most to least preferred, that is, elimination of risk, substitution, engineering controls, administrative controls and personal protective equipment)
- communicating with crew and others as appropriate about WHS/OHS matters
- conforming to established emergency response procedures for initial and follow-up action
- keeping accurate records/minutes of discussions with consultation forums on WHS/OHS matters
- identifying WHS/OHS training needs of crew
- interpreting and following information on WHS/OHS legislation, safety management system, organisational procedures, written job instructions, specifications, standard operating procedures, charts, lists, and other applicable reference documents
- investigating incidents according to organisational procedures
- keeping records for monitoring the effectiveness of practices and procedures with respect to the safety of the vessel
- maintaining incident records according to standard workplace procedures
- obtaining results of safety audits according to organisational procedures
- participating in consultation forums
- reporting and documenting the processes and outcomes of WHS/OHS requirements
- scheduling meetings with the relevant consultation forums to discuss WHS/OHS matters.

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:

- applicable commonwealth, state or territory WHS/OHS legislation, regulations, codes of practice, standards
- dangers of drug and alcohol abuse
- difference between hazards (something or a source or situation with the potential to harm life or health) and risks (chance of something occurring that will result in injury or damage)
- fatigue management and the importance of adequate rest

- hazard identification procedures such as vessel inspections and review of WHS/OHS data
- hierarchy of control and its application
- legal rights and responsibilities of management, crew and others as appropriate
- nature of common hazards for example chemicals, bodily fluids, noise, manual handling, work postures, underfoot hazards and moving parts of machinery
- organisation specific information including:
 - hazards of the particular work environment
 - hazard identification procedures relevant to hazards in the organisation
 - designated person for raising WHS/OHS issues
 - organisation and work procedures particularly those related to performance of own work, specific hazards and risk control, reporting of hazards, incidents and injuries and WHS/OHS issue resolution, consultation, use of personal protective equipment and emergency response
 - potential emergency situations, alarms and signals, and required response
- personal protective equipment requirements, including use, storage and maintenance
- principles of basic risk assessment
- roles and responsibilities of:
 - employees, supervisors and managers in the organisation
 - safety representatives and committees
- safety signs and their meanings, including signs for:
 - personal protective equipment
 - emergency equipment
 - dangerous goods class signs
- sources of WHS/OHS information within in the organisation with knowledge of external sources of WHS/OHS information
- specific hazards, such as sharps and radiation
- standard emergency signals, alarms and required responses.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF007 Operate survival craft and other lifesaving appliances

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to comply with accepted safety practices and standards in responding to abandon ship and survival situations.

This unit applies to crew members required to assist in the operation of survival craft and other lifesaving appliances on a range of vessels.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Launch survival craft and rescue boats

- 1.1 Preparations for the launch of the survival craft or rescue boat are made according to manufacturer instructions and organisational procedures
- 1.2 Launch strategy is adopted appropriate to the prevailing circumstances and conditions
- 1.3 Launching equipment is operated according to manufacturer instructions and organisational procedures

	1.4	Survival craft or rescue boat is launched smoothly according to accepted safety practices and standards
2 Operate survival craft and rescue boats	2.1	Pre-start checks are conducted on the engine
	2.2	Engine is started according to manufacturer instructions and organisational procedures
	2.3	Orders are given for survivors to board the survival craft
	2.4	Survival craft is cleared of the vessel and operated according to manufacturer instructions and organisational procedures
	2.5	Survival craft is manoeuvred appropriately for the prevailing circumstances and conditions
3 Operate lifesaving and survival equipment	3.1	Location and accessibility of all lifesaving and survival equipment is established
	3.2	Survival equipment is checked and operated according to manufacturer instructions and organisational procedures
	3.3	Lifesaving clothing is correctly donned and used according to manufacturer instructions and organisational procedures
	3.4	Strategies are implemented to counter threats to survival according to accepted survival practice
4 Recover survival craft	4.1	Persons are disembarked from the survival craft according to organisational procedures
	4.2	Survival craft is recovered according to manufacturer instructions and organisational procedures
	4.3	Survival craft and equipment are checked for signs of damage and faulty equipment
	4.4	Identified faulty equipment or damage is reported according to organisational procedures
5 Organise abandon vessel musters and drills	5.1	Abandon vessel musters and drills are arranged according to regulatory requirements and organisational procedures
	5.2	Instruction is provided to others on organisational procedures and the correct use of lifesaving equipment
	5.3	Musters and drills are reviewed against objectives
	5.4	Reporting obligations are completed according to regulatory requirements and organisational procedures

5.5 Risk control processes are implemented

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.

Survival craft and rescue boats must include:

- life rafts
- lifeboats
- rescue boats

Launching equipment must include:

- cranes
- davits
- life raft launching and inflation equipment

Lifesaving and survival equipment must include:

- immersion suits
- life jackets
- person overboard combination light and smoke float
- portable radio equipment
- pyrotechnic distress signals
- search and rescue transponders (SARTs)
- satellite emergency position indicating radio beacons (EPIRBs)
- thermal protective aids

- Strategies must include:
- beaching survival craft
 - deploying exposure cover on an open lifeboat
 - handling survival craft in rough weather
 - helicopter rescue from survival craft
 - maximising detect-ability of survival craft
 - preventing and treating hypothermia
 - rationing food and water
 - using rescue boat to marshal life rafts
 - using rescue boat to retrieve survivors in the sea

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF3004A Operate survival craft and other lifesaving appliances.

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 MARF007 Operate survival craft and other lifesaving appliances

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 on at least one occasion and include:

- acting appropriately in the prevailing circumstances and conditions in response to abandon ship and survival situations according to accepted safety practices and standards
- communicating effectively with others as required when operating survival craft and ancillary survival equipment
- conducting inspections of other survival equipment at intervals determined by the safety management system
- conducting tests and pre-start checks of equipment at intervals determined by the safety management system
- giving correct commands for launching and boarding survival craft and clearing the ship
- interpreting and applying International Convention for the Safety of Life at Sea (SOLAS) practices and regulations
- launching and operating various types of survival craft
- organising abandon vessel drills
- reading and interpreting instructions relevant to the safe operation of lifesaving appliances on board a vessel
- recovering survival craft and rescue boats and resetting release devices
- rowing and steering a survival craft and rescue boat
- safely operating off-load and on-load release devices
- selecting and using appropriate lifesaving appliances and communications equipment
- using a compass
- using portable radio equipment, pyrotechnics and other signalling equipment
- using survival craft equipment including rigging devices to aid location.

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:

- construction and outfit of survival craft and rescue boats
- dangers associated with the use of on-load release devices
- emergency muster and abandon vessel signals

- International Maritime Organization (IMO) safety symbols
- International Safety Management (ISM) Code safety management system plans, procedures, checklists and instructions
- maintenance procedures for survival craft and rescue boats
- manoeuvring characteristics of survival craft and rescue boats
- operation of survival craft and rescue boats, their launching appliances and arrangements and their equipment
- procedures and sequences for launching, carrying out pre-start engine checks and operating survival craft and rescue boats in a variety of sea and weather conditions
- procedures for correctly operating and using lifesaving appliances and personal safety equipment on vessels and survival craft
- relevant sections of applicable maritime regulations
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation
- SOLAS regulations
- symptoms of hypothermia, its prevention and treatment
- threats to survival on abandonment of a vessel and appropriate strategies for countering these threats
- typical manoeuvring and engine characteristics for survival craft
- ways of maximising detectability and location of survival craft using radio lifesaving appliances, pyrotechnic distress signals, satellite emergency position indicating radio beacons (EPIRBs), and search and rescue transponders (SARTs).

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF008 Prevent and fight fires on board a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to prevent fires and to respond effectively to any fire emergency on board a vessel.

This unit applies to deck and engine workers working in the maritime industry requiring a Certificate of Safety Training.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F - Operational Quality and Safety

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 Actively prevent fire	1.1	Fire hazards (pre-conditions for fire) on board a vessel are identified and rectified according to workplace procedures
	1.2	Onboard procedures for preventing fire are accessed and implemented
2 Prepare response to fire	2.1	Location and class of fire is identified
	2.2	Alarm is raised

- 2.3 Condition of firefighting equipment and systems in work area is monitored according to planned maintenance schedules
- 2.4 Realistic drills and musters are practised to ensure pre-incident readiness of response personnel
- 2.5 Appropriate protective clothing and equipment including self contained breathing apparatus (SCBA) is made ready
- 2.6 All available means to limit the spread of fire and smoke are employed
- 2.7 Appropriate pump/s and ancillary equipment are readied to support firefighting operations
- 2.8 Extinguishing media/agent is selected according to the class/classes of fire
- 3 Combat fire**
 - 3.1 Threats to life or health are identified within the emergency area
 - 3.2 Activities and tactics to combat the fire are selected so that the safety of the vessel and all on board is not compromised
 - 3.3 Fire is located and access is gained in the safest and most timely manner
 - 3.4 Fire is attacked using the extinguishing media/agent and application techniques appropriate to the class and size of fire
 - 3.5 SCBA is donned and used correctly while undertaking fire extinguishment and rescue
 - 3.6 Effectiveness of combat activities and tactics is evaluated and altered as required
 - 3.7 Communication is maintained to ensure safety and efficiency of firefighting operation
- 4 Complete post-fire activities**
 - 4.1 Fire watch is maintained to prevent further outbreak
 - 4.2 Equipment is restored to operational condition
 - 4.3 Fire scene is preserved prior to investigation, if appropriate
 - 4.4 Information relating to the incident is provided as part of fire debriefing session

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.

Fire hazards must include:

- accommodation
- cargo areas
- engine rooms
- electrical distribution systems
- fuel handling systems
- galleys
- lack of maintenance
- laundry
- poor housekeeping
- smoking
- stores areas

Classes of fire must include:

- A Carbonaceous Solids
- B Flammable Liquids
- C Flammable Gases
- D Combustible Metals
- E Energised Electrical Equipment
- F Cooking Oils and Fats

Firefighting equipment

- hoses
- fixed fitted detection and suppression systems

- and systems must include:
- foam applicators
 - international ship-to-shore connection
 - nozzles
 - portable and semi-portable extinguishers
 - stretchers/ropes and lines
- Protective clothing and equipment must include:
- head protection /helmet
 - hand protection /gloves
 - radiant heat protection /coat
 - foot protection/ boots
 - firefighter outfit as per current Fire Safety Systems Code (as applicable)
 - SCBA
- Extinguishing media/agent must include:
- extinguishing powder
 - foam
 - gaseous extinguishing agents
 - water
- Firefighting activities must include:
- boundary control
 - containing the spread of fire
 - evacuation of casualties from heated smoke filled environments
 - extinguishment
 - overhaul/fire watch
- Firefighting tactics must include:
- combination of attack
 - cooling the fuels
 - direct offensive (attack team)
 - direction of attack
 - exclusion of oxygen – smothering
 - indirect defensive (fixed system)
 - interrupting the chemical chain reaction
 - removal of fuels - starvation
- Restoring equipment must include:
- cleaning
 - re-stowing
 - recharging according to Australian Standards
 - servicing

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF3005A Prevent and fight fires on board a 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 MARF008 Prevent and fight fires on board a 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 on at least one occasion and include:

- applying extinguishing media to fire
- applying safe working practices at all times
- assisting in the setting up and use of foam making equipment
- correctly donning and using self contained breathing apparatus (SCBA) while undertaking fire extinguishment and rescue in a heated smoke filled compartment
- entering and moving through a compartment filled with high expansion foam with the aid of a lifeline and without breathing apparatus
- extinguishing a fire with a fire blanket
- logging SCBA wearers correctly on a control board
- operating charged hose-lines and nozzles
- operating portable firefighting extinguishers
- performing after-use maintenance on SCBA
- working as part of a team.

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:

- action to be taken:
 - in an emergency
 - on board ship
- alarms and signals during onboard emergencies
- chemistry of fire, including the fire tetrahedron and its relationship to materials typically found on vessels
- classification of fire and applicable extinguishing agents
- correct use of all lifesaving appliances and firefighting appliances
- different classes of fire, their characteristics and strategies and equipment needed for their extinguishment
- elements of fire and explosion (the fire triangle)
- extinguishing media including firefighting foams

- fire and smoke detection and automatic alarm systems
- firefighting tactics, techniques and procedures
- flammable materials, fire hazards and spread of fire
- hazards and threats to life or health during onboard firefighting operations
- lifeline signals
- location of firefighting appliances and emergency escape routes
- maintenance of lifesaving appliances and firefighting appliances
- need for constant vigilance
- onboard Emergency Response Organisation and procedures
- own ability and limits
- portable fire extinguishers
- principles and methods of fire extinguishment
- principles underlying the spread of fire
- relevant Australian Standards
- safe working practices
- shipboard firefighting organisation
- statutory requirements pertaining to lifesaving appliances and firefighting appliances
- types and sources of ignition
- types of fire detection, firefighting equipment and systems used on vessels, their features, principles of operation, procedures for their use and problems that can occur
- ventilation procedures
- vessel construction as it relates to fire prevention/protection
- 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARF009 Survive at sea in the event of vessel abandonment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to survive at sea in the event of vessel abandonment.

This unit applies to people working in the maritime industry requiring a Certificate of Safety Training.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F - Operational Quality and Safety

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 Respond to emergency

- 1.1 Emergency situation is correctly recognised
- 1.2 Muster and abandon vessel signals are activated according to organisational procedures
- 1.3 Prompt, accurate and clear information is given on raising alarm
- 1.4 Instructions are provided to crew and passengers to maximise

		chances of survival
	1.5	Emergency position indicating radio beacon (EPIRB) is operated to transmit distress signal
	1.6	Distress calls are made using radio equipment on distress call frequency to communicate nature of emergency
2	Launch survival craft and rescue boats	
	2.1	Preparations for the launch of the survival craft or rescue boat are made according to organisational procedures and manufacturer instructions
	2.2	Appropriate launch strategy is adopted following an assessment of the weather and sea conditions, and the nature of the emergency
	2.3	Launching equipment is operated according to organisational procedures and manufacturer instructions
	2.4	Survival craft or rescue boat is launched smoothly according to organisational procedures and manufacturer instructions
	2.5	Pre-start checks are conducted on the engine of the survival craft or rescue boat
	2.6	Survival craft or rescue boat engine is started according to organisational procedures and manufacturer instructions
3	Operate survival craft and rescue boats	
	3.1	Orders are given to survivors to board the survival craft or rescue boat using appropriate means
	3.2	Survival craft or rescue boat is cleared of the vessel and operated according to organisational procedures and manufacturer instructions
	3.3	Sea anchors and drogues are used to assist in remaining within the vicinity of the abandoned vessel and to minimise the effects of adverse weather and sea conditions
	3.4	Exposure cover is deployed on an open lifeboat according to manufacturer instructions
4	Operate lifesaving and survival equipment on board survival craft and rescue boats	
	4.1	Location and accessibility of all lifesaving and survival equipment is established
	4.2	Survival equipment is checked and operated according to manufacturer instructions
	4.3	Lifesaving equipment is correctly donned and used according to manufacturer instructions

5 Assume responsibility for survival of crew and passengers	5.1 Survivors are checked for signs of hypothermia or other injuries and first aid is applied where necessary 5.2 Water and food is rationed 5.3 Lookout for vessels and aircraft in the vicinity is maintained and distress signals are released on sighting 5.4 Instructions given by rescue personnel are followed to safely access rescue craft 5.5 Persons are disembarked from survival craft or rescue boat according to organisational procedures 5.6 Survival craft or rescue boat is recovered and checked for signs of damage

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.

Emergency situations must include:

- collision
- fire
- foundering

Radio equipment includes one or more of the following:

- EPIRB
- Global Maritime Distress and Safety System (GMDSS)
- HF

- search and rescue transponders (SARTs)
- VHF

Survival craft and rescue boats include one or more of the following:

- inflatable life raft
- life boat
- rescue boat

Lifesaving and survival equipment includes one or more of the following:

- EPIRBs
- flares
- life jackets
- immersion suit
- person overboard combination light and smoke float
- SARTs

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF3006A Survive at sea in the event of vessel abandonment.

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 MARF009 Survive at sea in the event of vessel abandonment

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 on at least one occasion and include:

- boarding a survival craft from the ship and water while wearing a life jacket
- determining the type and extent of the emergency
- donning a life jacket
- donning and using an immersion suit
- ensuring initial actions after leaving ship, and procedures and actions in the water minimise threats to survival
- freeing a survival craft of obstructions
- identifying hypothermia and providing appropriate treatment
- keeping afloat without a life jacket
- launching survival craft
- operating location devices, including radio equipment
- operating radio equipment
- operating survival craft equipment
- recognising and interpreting muster signals, and taking action that is appropriate to emergency and complies with established procedures
- righting an inverted life raft
- righting an inverted life raft while wearing a life jacket
- safely jumping from a height into water
- streaming a drogue or sea-anchor
- swimming while wearing a life jacket
- taking initial actions on boarding survival craft to enhance chance of survival
- timing and sequencing individual actions so they are appropriate to prevailing circumstance and conditions, and minimise potential dangers and threats to survival
- using appropriate method to board survival craft that avoids dangers to other survivors.

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:

- action to be taken in an emergency

- characteristics of survival craft
- emergency muster and abandon vessel signals
- equipment found in survival craft, its function and the procedures for correct operation
- equipment in survival craft
- first aid techniques
- location of personal life-saving appliances
- location of survival equipment on vessel
- principles concerning survival including:
 - value of training and drills
 - personal protective clothing and equipment
 - need to be ready for any emergency
 - actions to be taken when called to survival craft stations
 - actions to be taken when required to abandon ship
 - actions to be taken when in the water
 - actions to be taken when aboard a survival craft
 - main dangers to survivors
- procedures for abandoning vessel
- relevant maritime regulations related to required survival equipment on a vessel
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- standard safety symbols
- steps to be taken after collision, grounding or other marine casualty and resulting hull damage
- survival at sea techniques
- techniques for using survival equipment
- time required to make distress calls safely
- types of emergency situations which may occur such as collision, fire, foundering
- types of life-saving appliances normally carried on ships
- use of distress signals and penalty for misuse.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF010 Work safely in confined spaces on a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to enter and work safely in confined spaces on a vessel.

This unit applies to all maritime employees who could be required to work in, on or around confined spaces on board a vessel.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F - Operational Quality and Safety

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 Identify confined spaces and their regulatory framework

- 1.1 Characteristics of a confined space are outlined
- 1.2 Confined spaces in the workplace are identified
- 1.3 Regulations and standards relevant to confined space operations on vessels are identified
- 1.4 Relevant codes of practice and sources of guidance for undertaking confined space work are identified

	1.5	Potential hazards of confined spaces are identified
2 Assess confined space for entry	2.1	Purpose and need to enter confined space is confirmed
	2.2	Hazards in and around confined space and those associated with work to be performed are identified
	2.3	Risk assessment is conducted and documented according to organisational procedures
	2.4	Risk control measures are identified and documented
3 Obtain permission to enter confined space	3.1	Process and documentation required for authorisation to enter confined space are identified
	3.2	Permission to enter and work in confined space is sought from authorised personnel on vessel according to regulatory and organisational requirements
	3.3	Permit requirements associated with confined space entry and work to be performed are confirmed and completed
4 Plan and prepare for entry	4.1	Appropriate plan is prepared for completion of work activity in confined space
	4.2	Process is followed to ensure confined space is ready for entry
	4.3	Appropriate personal protective clothing and equipment is selected and used correctly
	4.4	Entry equipment is made ready and used according to manufacturer operating instructions
	4.5	Precautions during entry are identified to protect occupants
5 Apply emergency procedures	5.1	Role and responsibilities of standby person/s are clearly defined
	5.2	Planned emergency procedures appropriate for circumstances are implemented
	5.3	Personal protective equipment and emergency rescue equipment is selected, prepared and used
6 Conclude confined space operations	6.1	Personnel involved and equipment used are accounted for
	6.2	Equipment is cleaned, inspected and/or serviced prior to stowage

- 6.3 Confined space entry is secured, isolations are removed and space is returned to normal
- 6.4 Permit is withdrawn and documentation is completed according to regulatory requirements and organisational policy

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.

Characteristics of a confined space must include:

- those described in the Occupational Health and Safety (Maritime Industry) (National Standards) Regulation and/or Australian Standard (AS/NZS) 2865 Safe working in a confined space

Confined spaces include one or more of the following:

- ballast tanks
- battery lockers
- boilers
- cargo tanks/holds
- chain lockers
- cofferdams
- compressor rooms
- double bottoms
- duct keels
- engine components
- fuel tanks

	• furnaces • inert gas scrubber plants • pump rooms • sewage tanks • storage areas for fixed fire extinguishing media • trunking and pressure vessels • void spaces
Regulations, standards and codes of practice must include:	• Code of Safe Working Practice for Australian Seafarers - Section 10 Entering and working in enclosed or confined spaces • International Safety Management (ISM) Code • Navigation Act 2012 • Occupational Health and Safety (Maritime Industry) (National Standards) Regulations 2003
Regulations, codes of practice and standards include one or more of the following:	• AS/NZS 2865 Safe working in a confined space • International Maritime Organization (IMO) Resolution A 1050 (27) Revised Recommendations for Entering Enclosed Spaces Aboard Ships • International Maritime Solid Bulk Cargoes (IMSBC) Code • International Safety Guide for Oil Tankers and Terminals (ISGOTT) • Liquefied Gas Handling Principles on Ships and in Terminals (SIGTTO) • shipboard confined /enclosed space entry procedures
Vessels include:	• any Australian or international commercial vessel or unit
Hazards include one or more of the following:	• cold pipes and valves (refrigeration and liquefied gases etc.) • dangerous goods in packaged form • electricity and wiring systems • flammable or explosive atmospheres • free flowing solids • height • hot pipes (steam, fuel oil, lubricating oils etc.) • manual handling • moving equipment • noise • oxygen deficiency or enrichment

- physical obstructions such as transverse frames and floors
- poor visibility
- products or processes in adjacent spaces
- restricted access
- rising liquids
- slippery or uneven surfaces
- temperature extremes
- toxic liquids, solids, gases, vapours and dusts
- vibration

Risks include one or more of the following:

- asphyxiation
- contamination
- engulfment
- falling
- fire or explosion

Risk control measures include one or more of the following:

- atmospheric testing
- barricading
- cleaning
- de-energising
- isolation
- lockout
- purging
- signage
- tag out
- ventilation

Authorised personnel include one or more of the following:

- Master
- Delegated Safety Officer
- Chief Mate
- Chief Engineer
- 1st Engineer

Permit requirements include one or more of the following:

- atmospheric testing results
- cold work permit
- communications
- competent person who has control of the space and the authorising officer's signature
- date and period of validity

- hazards that are likely to be present
- height permit
- hot work permit
- isolation checklist
- locations of the space
- need for respiratory protection
- personal protection clothing required
- personal protective equipment required
- person/s entering
- rescue arrangements and emergency equipment
- risk control measures
- standby person/s

Ready for entry include one or more of the following:

- communications understood and tested
- control measures confirmed and implemented
- development of an appropriate plan to complete works in the space
- emergency plan confirmed as appropriate or modified and equipment in position at the ready
- method of safe entry and exit in place
- permit/s signed by the Responsible Officer and posted
- safe atmosphere confirmed (or relevant measures in place to ensure safe entry into an unsafe atmosphere)
- space is secured
- standby person/s identified and in position

Personal protective clothing and equipment include one or more of the following :

- atmospheric monitoring equipment
- chemically resistant splash suits
- coveralls
- gloves
- harness and restraint equipment
- helmet
- respiratory protection (self rescue devices and self contained breathing apparatus [SCBA])
- safety boots
- safety glasses or goggles

Entry equipment include one or more of the following:

- anchor straps and/or anchor points
- atmospheric testing and monitoring equipment
- confined space harnesses

- fall arrest systems equipment
- intrinsically safe torches/lifting
- lifeline/signalling line
- lockout kit
- retractable lanyard/s
- rope kit/winching
- SCBA
- signage
- tripod
- ventilation fan and ducting

Precautions during entry include one or more of the following:

- atmosphere must be tested prior to entry, before re-entry and at frequent intervals
- atmospheric monitoring must occur during occupancy
- if conducting prolonged work activities or in extreme temperatures, regular breaks should be taken
- if entry to unknown or unsafe atmospheres cannot be avoided the use of suitable breathing apparatus e.g. airline or self-contained should be employed
- occupants must be provided with calibrated and tested multi-gas detectors
- standby person must maintain communications with occupants and relevant personnel
- ventilation must continue while the space is occupied

Role and responsibilities of standby person/s include:

- as defined in Regulation 4.18 Part 4 of the Occupational Health & Safety (Maritime Industry) (National Standards) Regulation

Emergency rescue equipment includes one or more of the following:

- atmospheric monitoring equipment
- emergency escape breathing devices
- first aid kit
- harnesses
- helmets
- lighting
- oxygen resuscitation kit
- rescue ropes
- rope recovery kit
- SCBA
- stretcher

- tripod

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF3007A Work safely in confined spaces on a 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 MARF010 Work safely in confined spaces on a 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 on at least one occasion and include:

- completing necessary documentation associated with confined space entry
- continuously monitoring and checking conditions and hazards when working in a confined space on a vessel
- developing effective planning documents
- identifying and implementing control measures to mitigate risk
- recognising defective equipment and taking appropriate action
- recognising hazards and risks when preparing to enter, entering and working in confined spaces
- reading and interpreting regulations, codes of practice, permit requirements, instructions and procedures for entry into a confined space on a vessel
- selecting, inspecting and using safety and emergency equipment according to operating instructions
- taking appropriate action during an emergency
- taking actions promptly to identify, report, and/or rectify hazards and emergency situations when working in a confined space
- using atmospheric detection equipment and interpreting the readings
- using basic verbal and/or defined communication skills and signals when entering and working in confined spaces
- working safely and collaboratively with others when entering and working in a confined space.

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:

- atmospheric testing and monitoring equipment and techniques
- communications systems:
 - air horns
 - alarm/indicator panels
 - face-to-face

- lifeline/signalling line
- two way radios
- communication techniques used when entering and working in confined spaces on a vessel
- criteria that defines a confined space
- emergency entry and exit procedures
- inherent and work related hazards associated with confined spaces
- procedures and permit requirements for confined space entry
- relevant legislative and/or regulatory framework that impacts on confined space entry
- role of standby person/s
- safe operational procedures for the use of self contained breathing apparatus (SCBA)
- ventilation of confined spaces
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF011 Manage firefighting and fire prevention activities on board a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage firefighting and fire prevention activities on board a vessel.

This unit applies to deck and engine officers who are required by Marine Order 3 to be in charge of firefighting activities on board a vessel.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Manage fire prevention activities

1.1	Hazards including dangerous goods on board a vessel are identified and appropriate action is implemented as determined by industry standard documentation
1.2	Legislative requirements and current industry standards relating to the maintenance and operation of fire detection, firefighting equipment and systems on board are met and

- complied with
- 1.3 Inductions or other educational activities are organised to ensure awareness of causal factors of on-board fires, prevention methods and standard operating procedures when fire alarms are activated
- 2 Plan for fire emergencies**
- 2.1 Vessel fire control plan is consulted to review and develop appropriate response to any fire
 - 2.2 Contingencies are anticipated, planned for and practised
 - 2.3 Evacuations are prepared for and practised according to regulatory requirements
 - 2.4 Roles/functions of command and firefighting team members, as related to fire prevention and suppression, are established and reviewed according to regulatory and organisational requirements
 - 2.5 Firefighting training exercises are developed and implemented according to regulatory and organisational requirements
 - 2.6 Training exercises are prepared, practised and debriefed according to regulatory and organisational requirements, to ensure readiness for any fire emergency
- 3 Coordinate tactical firefighting activities in response to a fire emergency**
- 3.1 Gathering of full and accurate information on the nature and extent of the fire by the command team is overseen
 - 3.2 Order of priority and sequence of actions appropriate to the requirements of the incident is determined and communicated to the responding crew clearly and accurately
 - 3.3 Evacuation of personnel, if appropriate, is conducted according to regulatory requirements
 - 3.4 Search and rescue operations are conducted using established marine firefighting best practice
 - 3.5 Controlled ventilation techniques are correctly applied during fire suppression and rescue operations
 - 3.6 Treatment of injured personnel is timely and according to current best casualty management practice
 - 3.7 Operational tactics are monitored for their effectiveness and adjusted when required to ensure best outcomes

	3.8	Operational tactics are monitored to ensure vessel stability and integrity is maintained
	3.9	All shore-side involvement in an on-board fire emergency is coordinated and monitored effectively
4 Manage post fire activities	4.1	Fire watch is coordinated to prevent re-ignition
	4.2	Fire affected area is secured prior to investigation according to regulatory and organisational requirements
	4.3	Equipment is restored to operational condition where applicable
	4.4	Cause of the fire is investigated and determined according to regulatory and organisational requirements
	4.5	Incident reports are completed according to regulatory and organisational requirements

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.

- Hazards must include:
- contents of adjacent spaces
 - dangerous goods
 - electricity and wiring systems
 - flammable or explosive atmospheres
 - oxygen deficiency or enrichment

	• physical obstructions • poor visibility • restricted access • toxic liquids, solids, gases, vapours and dusts •
Fire detection, firefighting equipment and systems include one or more of the following:	• common on board suppression systems • hoses and nozzles • pumps • rescue equipment • self contained breathing apparatus (SCBA) • thermal and smoke detectors
Fire control plan must include:	• applications of the BC Code • applications of the International Maritime Dangerous Goods (IMDG) Code • communication strategy • contingency plans for fires involving hazardous materials • evacuation plan • handling and treatment of injured personnel • hazard control strategies • search and rescue operations • strategies for liaison with shore-based agencies (such as environmental protection agencies, fire services, medical teams, port authorities) • strategies for shipboard firefighting management in port • tactical methods for fighting fires involving hazardous materials • tactical plan of action
Contingencies include one or more of the following:	• change in fire behaviour or extent • equipment failure or unavailability • unexpected personnel involvement
Restored must include:	• after use, maintaining SCBA to industry standards • cleaning • recharging extinguishers according to Australian Standards • re-stowing • servicing

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF4001A Manage firefighting and fire prevention activities on board a 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 MARF011 Manage firefighting and fire prevention activities on board a 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 on at least one occasion and include:

- communicating effectively with crew and passengers during fire emergencies
- determining the type and extent of the fire and initiating appropriate, timely, actions
- ensuring order of priority, timing and sequence of actions are appropriate to the overall requirements of the incident and minimise damage and potential damage to the vessel, injuries to personnel, and impairment of the operational effectiveness of the vessel
- evaluating effectiveness of firefighting activities and tactics during fire emergencies
- initiating appropriate action and providing solutions to problems with firefighting equipment and operations during fire emergencies
- liaising with shore-based emergency organisations during fire emergencies
- managing fire prevention and suppression activities on a vessel
- managing on-board firefighting training for shipboard firefighting teams
- managing shipboard firefighting teams and their tactical activities during fire emergencies
- managing the maintenance of firefighting equipment and systems
- providing leadership to shipboard personnel and passengers during fire emergencies
- recognising and interpreting fire alarms and initiating appropriate response
- safeguarding personal safety during fire control activities at all times
- taking actions to control fires based on a full and accurate assessment of the incident, using all available sources of information
- transmitting information promptly, accurately, completely and clearly.

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:

- assessment of cause of incidents involving fire
- chemistry of fire and its relationship to combustible materials typically found on vessels
- communication and coordination during firefighting operations
- composition and allocation of personnel to fire parties
- control of fuel and electrical systems

- different classes of fire and the most appropriate extinguishing agents, application equipment and methods of extinguishment for each
- fire-detection systems: fixed fire-extinguishing systems; portable and mobile fire-extinguishing systems, including appliances, pumps and rescue, salvage, life-support, personal protective and communication equipment
- fire precautions and hazards associated with the storage and handling of materials (paints etc.)
- firefighting procedures at sea and in port, with particular emphasis on organisation, tactics and command
- firefighting process hazards (dry distillation, chemical reactions, boiler uptake fires etc.)
- firefighting involving dangerous goods
- implications of shipboard firefighting management in port and the procedures that must be followed to comply with port and state regulations
- importance of maintenance of fire detection and firefighting equipment on board vessels
- life and health risks associated with fires on vessels
- management and control of injured persons
- maritime communication techniques applicable to the management of fire prevention and firefighting activities on board a vessel
- methods for checking and replacing consumable materials in fire detection, fire-fighting equipment and systems on board vessels
- preparation of contingency plans
- principle of operation of fixed fire suppression systems
- principles underlying the spread of fire and its extinguishment
- problems likely to be encountered during the management of a shipboard fire and related tactics and solutions that can be applied
- procedure for safe activation of fixed firefighting systems
- procedures for coordination of shore-based firefighters
- relevant regulations, codes of practice, policies and procedures relating to the maintenance of fire detection, firefighting equipment and systems on board vessels
- requirements for on-board firefighting training
- requirements for statutory and classification surveys
- safety data sheets/material safety data sheets relevant to the various products and substances carried on vessels
- strategies and tactics for control of fires in various parts of the vessel
- strategies for rapid briefing of shore-based emergency organisations using the vessel fire control plan
- types of fire detection, firefighting equipment and systems used on vessels, their features, principles of operation, the procedures for their use and remediating problems that can occur during use
- typical actions of passengers in a shipboard fire
- use of water for fire extinguishing, the effect on ship stability, precautions and corrective procedures
- ventilation control, including smoke extraction

- work health and safety (WHS)/occupational health and safety (OHS) requirements and safe 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF012 Control safe access to and on vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to control safe access to and on a vessel.

This unit applies to maritime workers working in the maritime industry as a Watchkeeper Deck; as a Master, Chief Mate or Watchkeeper Deck on ships of less than 500 gross tonnage (GT) in any operating area; or as Master or Chief Mate of vessels less than 3000 GT operating in near coastal waters.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Rig equipment

- 1.1 Preparations for the rigging of access equipment are made according to manufacturer instructions and organisational procedures
- 1.2 Access equipment is deployed according to organisational procedures
- 1.3 Safety checks and precautions are carried out according to

- organisational procedures
- 1.4 Defective equipment is identified and reported, repaired or replaced according to organisational procedures
- 1.5 Access equipment is unrigged and stowed after use
- 2 Monitor access of persons to and on vessel**
- 2.1 Persons accessing the vessel are advised and instructed on the procedures for using access equipment
- 2.2 Access of persons to and on vessel is supervised
- 2.3 Any problems with persons accessing the vessel are identified and resolved or reported
- 3 Monitor safety of personnel working aloft and over side of vessel**
- 3.1 Personnel going aloft or over side are instructed on the procedures and safety precautions to be followed
- 3.2 Equipment for going aloft or over side is rigged and checked prior to operations commencing
- 3.3 Appropriate personal protective equipment for working aloft or over side is made available and instructions are provided on its use
- 3.4 Faulty equipment is identified, isolated and reported to enable prompt repair and/or replacement
- 3.5 Emergency and rescue procedures are confirmed and agreed before work commences
- 3.6 Operations of personnel aloft or over the side are supervised and any problems are identified and resolved or reported
- 3.7 Safety incidents arising in the course of work aloft or over side are reported and recorded according to statutory requirements and organisational procedures
- 4 Monitor safety of personnel working in confined spaces on a vessel**
- 4.1 Risk assessment of confined space entry is conducted and documented according to organisational and regulatory requirements
- 4.2 Permission to enter and work in a confined space is sought from authorised personnel according to regulatory requirements
- 4.3 Permits are completed with conditions of validity and submitted for approval to designated personnel according to regulatory requirements

- 4.4 Appropriate plan is prepared for the completion of the work activity in the confined space
- 4.5 Operations of personnel working in confined spaces are supervised and any problems are identified and resolved or reported
- 4.6 Planned emergency and rescue procedures are followed in the event of an accident or other emergency
- 4.7 Evacuation of confined space is supervised and sign out is completed on entry permit

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.

- Access equipment includes one or more of the following:
- gangways
 - gas and oxygen meters
 - pilot hoist
 - pilot ladder
 - staging

- Equipment for going aloft or over side includes one or more of the following:
- fall arrest devices
 - ladders
 - ropes
 - safety harness

	• staging
Personal protective equipment for working aloft or overside includes one or more of the following:	• hard hats • immersion suit • life jacket • thermal protective aids • safety lines
Confined spaces includes one or more of the following:	• ballast or oil tank • cargo hold • cargo tank • double bottom tank • duct keel • space entered through a small hatchway or access point • void space
Risk assessment includes one or more of the following:	• atmosphere that contains potentially harmful levels of contaminants • atmospheric conditions such as high temperature and humidity that cause fatigue • corroded or otherwise damaged ladders and landings • engulfment by 'fluid' cargo such as grains • external hazards connected to or adjacent to the space • harmful non-toxic or non-explosive dusts • isolation of electrical equipment • operation of radar scanners • oxygen deficiency or excess • poor visibility and lighting • restricted access and movement making escape and rescue difficult • slippery conditions that might result in injury from falls • toxic liquids, solids, vapours, gases and dusts • work processes which may introduce flammable, volatile and/or toxic gasses and vapours
Regulatory requirements includes one or more of the following:	• Australian Standard (AS/NZS) 2865:2001 Safe working in a confined space • vessel and organisation safety management system plans, procedures, checklists and instructions

- Authorised personnel include one or more of the following:
- Chief engineer
 - Master
 - work health and safety (WHS)/occupational health and safety (OHS) representative
- Permits include one or more of the following:
- gas free certificate
 - hot work permit
 - permit to enter
- Appropriate plan includes one or more of the following:
- atmospheric tests
 - communications system
 - emergency and rescue arrangements
 - identification of standby person/s
 - isolation of confined space
 - permits
 - personal protective equipment
 - procedures for entering and exiting a confined space
 - strategy for recovery of injured and unconscious person/s
 - ventilation of space

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF5001A Control safe access to and on 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 MARF012 Control safe access to and on 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 on at least one occasion and include:

- communicating effectively when controlling safe access to and on a vessel
- completing entry permits and other related documentation
- conducting atmospheric assessments with oxygen meter and gas detecting equipment
- identifying and controlling hazards in confined spaces
- interpreting relevant legislative responsibilities in relation to working in confined spaces
- managing safety of personnel aloft and over side of vessel
- reading, interpreting and applying instructions relevant to the rigging of personnel and pilot access ways on a vessel
- recognising routine problems that may occur when controlling safe access to and on a vessel and taking appropriate action
- rigging personnel and pilot access ways
- selecting and using rigging and safety equipment according to standard operating procedures and safety management systems
- supervising persons working in confined spaces
- tying required knots and handling ropes
- using emergency and safety equipment according to operating instructions
- working safely and collaboratively with others working in a confined space
- working safely and collaboratively with others when rigging personnel and pilot access ways to and on a vessel.

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:

- applicable personal protective safety equipment and procedures for its use
- atmospheric hazards and assessment methods
- communication techniques used when entering and working in a confined space
- electrical safety
- emergency entry and exit procedures
- equipment used in confined space entry

- hazard identification procedures
- hazards to health and safety in confined spaces
- maintenance and storage procedures for equipment used when working aloft or over side
- maritime security levels and their impact on security measures and procedures on board ship and in port facilities
- precautions to be taken:
 - when entering enclosed spaces
 - before and during repair and maintenance work
- principle design and safety features and component parts of personnel and pilot access ways typically used on vessels
- safety measures for hot and cold work
- security reporting procedures
- ship/shore safety checklist
- relevant sections of applicable maritime regulations
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- risk management strategies for entry to confined spaces
- role of standby personnel while a person enters and works in a confined space
- routine problems that may occur when controlling safe access to and on a domestic vessel and appropriate action and solutions
- safe systems of work
- special procedures and permit requirements for particular types of work in confined spaces
- standard operating procedures and safety precautions to be followed when working:
 - aloft or over side
 - in confined spaces
- standard operating procedures for rigging personnel and pilot access ways
- types of confined spaces encountered in the maritime industry
- types of knots, bends and hitches required when rigging personnel and pilot access ways, their characteristics, applications and limitations, and methods of tying them using synthetic and fibre rope of varying construction and size
- WHS/OHS requirements for confined space entry.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARF013 Provide medical first aid on board a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to provide immediate first aid in the event of accident or illness on board a vessel.

This unit applies to maritime workers working in the maritime industry as a Watchkeeper Deck; as a Master, Chief Mate or Watchkeeper Deck on ships of less than 500 gross tonnage (GT) in any operating area; or as Master or Chief Mate of vessels less than 3000 GT operating in near coastal waters; or as Marine Engineer Class 2 on commercial vessels greater than 3000 kW; or as a Marine Engineer Class 1 on commercial vessels of unlimited propulsion power.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Prepare to respond to emergency on board

1.1	Casualty condition is assessed and appropriate response is determined in order to minimise hazards and determine the need for emergency medical assistance
1.2	Options for transporting casualty or waiting for medical assistance are evaluated in relation to environmental issues,

		transport availability and casualty condition
	1.3	Casualty is sheltered from elements according to environmental conditions, if required
2 Provide first aid on board	2.1	Nature of casualty injury/condition and relevant first aid procedures are determined and explained to the casualty
	2.2	Consent is sought from the casualty prior to applying first aid
	2.3	First aid is provided to address casualty condition and according to effective first aid principles
	2.4	Casualty condition is monitored and ongoing first aid is provided as required
	2.5	Casualty is calmly reassured according to effective first aid principles
	2.6	Condition of casualty is documented over time to assist in providing ongoing first aid
3 Work in conjunction with medical and emergency services support	3.1	Communication links are established with medical services using relevant communication equipment to ensure prompt control action is taken
	3.2	Appropriate medical assistance is sought according to the circumstances
	3.3	Medication is administered under direction from an authorised health worker as required
	3.4	Directions given by emergency services are followed to assist in the evacuation of the casualty, if required
4 Participate in debriefings	4.1	Information is provided on the incident and the first aid assistance provided
	4.2	Clarifications are provided, where required
	4.3	Suggestions are provided to improve future operations

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.

Emergency includes one or more of the following:	• asphyxia • burns and scalds and the effects of heat and cold • cardiac arrest • drowning • fractures, dislocations and muscular injuries • medical care of rescued persons
Options for transporting casualty or waiting for medical assistance include one or more of the following:	• advice given by authorised health worker • severity of injury • time required for medical assistance to arrive • whether movement might cause a deterioration in casualty condition • whether contact with medical and/or emergency services has been achieved
Documented includes one or more of the following:	• administration of medications including time, date, dose, person administering • description of injury • first aid management • fluid/oral intake/output including fluid loss via blood, vomit, faeces, urine • location • time • vital signs
Communication equipment includes one or	• GMDSS equipment • VHF radio

more of the following:

Authorised health worker includes one or more of the following:

- general practitioner
- nurse practitioner
- paramedic/ambulance officer

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF5002A Provide medical first aid on board a 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 MARF013 Provide medical first aid on board a 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 on at least one occasion and include:

- accurately listening to, clarifying and applying medical instructions
- administering medication under direct instruction from an authorised health worker
- conducting an initial casualty assessment
- demonstrating adequate infection control procedures
- evaluating available options for transporting or maintaining condition of casualty
- examining casualty or patient
- identifying and preparing an area for safe evacuation
- improvising treatment and associated resources
- minimising the risk of harm to self and others at all times
- planning an appropriate first aid response in line with established first aid principles, policies and procedures
- preparing incident reports
- promptly completing identification of probable cause, nature and extent of injuries according to current first aid practice
- using available communication methods and equipment to access medical assistance.

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:

- body structure and function
- burns, scalds and the effects of heat and cold
- cardiac arrest, drowning and asphyxia
- first aid kit
- fractures, dislocations and muscular injuries
- medical care of rescued persons
- pharmacology
- radio medical advice
- sterilisation

- toxicological hazards on board including use of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) or its national equivalent
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF014 Respond to emergencies

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to deal with maritime emergencies and incidents.

This unit applies to maritime workers working in the maritime industry as a Watchkeeper Deck; as a Master, Chief Mate or Watchkeeper Deck on ships of less than 500 gross tonnage (GT) in any operating area; or as Master or Chief Mate of vessels less than 3000 GT operating in near coastal waters.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Raise alarms

- 1.1 Urgency of situation and nature of emergency is identified promptly
- 1.2 Relevant alarms are activated
- 1.3 Distress signals are used to indicate need for assistance, if required

2 Control onboard emergency	2.1 Initial actions on becoming aware of emergency are undertaken according to contingency plans and are appropriate to urgency of situation and nature of emergency 2.2 Onboard personnel are given information and instructions clearly and accurately 2.3 Procedures are implemented to combat emergency and to protect persons on board 2.4 Communications are established with others to facilitate emergency response process 2.5 Injured persons are provided with assistance 2.6 Contact is maintained with others at all times to keep them briefed on emergency response process 2.7 Preparation for abandoning vessel is undertaken, if required 2.8 Cessation of emergency is communicated to appropriate personnel
3 Respond to a distress signal at sea	3.1 Distress signals from others are recognised immediately 3.2 Nature of assistance required is identified 3.3 Capability to safely assist or relay emergency is determined taking into account own safety and physical proximity to emergency 3.4 Appropriate response to emergency is prepared for and implemented according to contingency plans and instructions in standing orders 3.5 Cessation of emergency is communicated to appropriate personnel

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.

Nature of emergency includes one or more of the following:

- anchoring
- assisting a vessel in distress
- collision
- contaminated fuel
- emergencies which arise in port
- engine breakdown or malfunction
- fire
- flooding
- grounding
- hypothermia
- incidents
- injuries/illness
- lack of fuel
- lost
- person overboard
- rescuing persons from sea
- sinking
- swamping

Relevant alarms include one or more of the following:

- abandon ship signals
- fire and lifeboat muster alarms
- mayday broadcast

Distress signals include one or more of the following:

- emergency position indicating radio beacons (EPIRB)
- flags
- hand signals
- International Code Signal of Distress
- light signals
- pyrotechnic distress signals
- radio
- reflective mirror

- V-sheet

Initial actions include one or more of the following:

- damage assessment and control
- manoeuvring vessel

Others include one or more of the following:

- aircraft
- other vessels
- search and rescue authorities

Nature of assistance includes one or more of the following:

- assisting a ship in distress
- rescuing persons from sea
- responding to emergencies occurring in port

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF5003A Respond to emergencies.

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 MARF014 Respond to emergencies

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 on at least one occasion and include:

- applying first aid
- correctly using lifesaving appliances
- if appropriate, manoeuvring vessel, according to contingency plans
- immediately recognising a distress or emergency signal
- implementing contingency plans and instructions in standing orders when responding to a distress signal at sea
- promptly identifying type and scale of emergency
- working as part of a team.

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:

- common emergency actions
- contents of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
- initial action to be taken following a collision or grounding
- initial damage assessment and control
- one's surroundings and changes to these surroundings
- precautions for protection and safety of passengers in emergency situations
- procedures to be followed for:
 - rescuing persons from the sea
 - assisting a vessel in distress
 - responding to emergencies that arise in port
- range of lifesaving appliances
- types of maritime emergency incidents and situations
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARF015 Manage provision of medical care on board a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to provide medical care to people who are sick and/or injured while they remain on board a vessel.

This unit applies to maritime workers working in the maritime industry as a Master Unlimited or a Marine Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

F – Operational Quality and Safety

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 Manage vessel medical care

- 1.1 Availability of adequate resources is monitored and maintained to support medical responses
- 1.2 Regular inspections of stock and equipment are conducted to ensure currency and operational readiness, according to organisational requirements
- 1.3 Equipment and resources are stored and maintained according to regulatory requirements and

- manufacturer/supplier instructions
- 1.4 Risks on the vessel are reviewed and organisational policies and procedures related to the provision of medical care are validated
 - 1.5 Planning is conducted for responses to major incidents on board the vessel
- 2 Take charge of a casualty on board**
- 2.1 Safety of injured or ill person, bystanders and self in an accident situation is assessed according to first aid procedures
 - 2.2 Safety requirements associated with providing medical care and vessel environmental requirements are adhered to
 - 2.3 Condition of injured or ill person is assessed according to first aid procedures
 - 2.4 Position of injured or ill person is adjusted to optimise personal comfort for the medical condition or injury
 - 2.5 Injured or ill person is reassured and supported during the wait for medical assistance
 - 2.6 Nature of the illness/injury is explained to injured or ill person
 - 2.7 Significance of changes in person's condition is promptly recognised and appropriate action is taken if there are signs of deterioration in injured or ill person
 - 2.8 Calm, confident and reassuring personal attitude is conveyed
- 3 Provide medical care**
- 3.1 Medical emergencies and injuries are identified and assessed correctly, and appropriate action is taken to prevent further injury
 - 3.2 Symptoms and appropriate treatment are identified based on the concepts of clinical examination and medical history
 - 3.3 Medical emergencies and injuries are diagnosed and managed according to accepted medical practice, and relevant national and international guides
 - 3.4 Manufacturer recommendations and accepted medical practice with regard to dosage and application of drugs and medication are complied with
 - 3.5 Complete and effective methods to protect against infection

and spread of diseases are used

3.6 Resuscitation techniques are performed following safety procedures, if required

3.7 Appropriate techniques for moving injured or ill person are used

3.8 Resources and equipment are recovered and reprocessed, and waste is disposed of safely

4 Seek external assistance

4.1 Condition of injured or ill person is documented over time to assist with ongoing management

4.2 Communication links are established with external medical services to ensure prompt control action is taken

4.3 Clinical examination procedures are completed and instructions received are complied with

4.4 Assessments of person's condition are relayed to external medical advisors

4.5 Medical procedures are carried out under medical instruction using relevant communication equipment and instructions received are complied with

4.6 Condition of injured or ill person is evaluated to determine transport requirements for additional medical care

4.7 Preparation for the evacuation of injured or ill person by emergency services is provided, if required, according to organisational procedures and welfare of person is maximised

4.8 Resources and equipment are recovered and reprocessed, and waste is disposed of safely

5 Manage first aid records

5.1 Documentation is completed in accordance with regulatory and organisational requirements

5.2 First aid records are maintained in accordance with regulatory and organisational requirements

5.3 Relevant documents are sent to appropriate bodies in accordance with regulatory and organisational requirements

5.4 Confidentiality of records and information is maintained in accordance with privacy principles and regulatory and organisational requirements

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.

Resources include one or more of the following:

- backboards
- blood pressure cuff
- cervical collars
- defibrillation units
- dressings
- eyewash
- first aid kits
- injections
- oxygen resuscitation cylinders
- pocket face masks
- pressure bandages
- rubber gloves
- soft bag resuscitator
- spacer device
- stretchers
- thermometers
- thermal blankets

Safety of injured or ill person includes one or more of the following:

- bodily fluids
- environmental risks
- equipment, machinery and substances

- first aid equipment
- risk of further injury
- risks associated with the proximity of crew or passengers

Medical emergencies and injuries include one or more of the following:

- care of casualty involving:
 - head and spinal injuries
 - injuries of ear, nose, throat and eyes
 - external and internal bleeding
 - burns, scalds and frostbite
 - fractures, dislocations and muscular injuries
 - wounds, wound healing and infection
- dealing with a death at sea
- dressing and bandaging
- giving vaccinations
- managing acute abdominal conditions
- providing:
 - dental care
 - gynaecological, pregnancy and childbirth support
 - medical care of rescued persons
 - minor surgical treatment
 - pain relief
- treating:
 - sexually transmitted diseases
 - tropical and infectious diseases
 - alcohol and drug abuse
- using disease prevention techniques including disinfection, de-infestation, de-ratting
- using techniques of sewing and clamping

Medication includes one or more of the following:

- adrenaline
- analgesics
- aspirin
- bronchodilators
- oxygen
- pain relief/paracetamol

Communication links include one or more of the following:

- electronic equipment
- email
- flags

- HF/VHF radio
- satellite phones
- two-way radio
- use of medical codes

Preparation for the evacuation includes one or more of the following

- communicating with helicopter, vessel or ambulance conducting the evacuation
- relevant first aid supplies and resources
- selecting relevant communication equipment

Documentation includes one or more of the following:

- casualty history forms
- day book
- disease notification to quarantine officials
- D-Rat Certificate
- first aid risk assessment
- incident/injury reports
- infection control records
- management records
- medical histories
- medication registers
- stock records
- workcover forms
- workers' compensation

Unit Mapping Information

This is a new unit. This unit is equivalent to MARF6002A Manage provision of medical care on board a 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 MARF015 Manage provision of medical care on board a 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 on at least one occasion and include:

- caring of casualty involving:
 - head and spinal injuries
 - injuries of ear, nose, throat and eyes
 - external and internal bleeding
 - burns, scalds and frostbite
 - fractures, dislocations and muscular injuries
 - wounds, wound healing and infection
- dealing with a death at sea
- dressing and bandaging
- giving vaccinations
- managing acute abdominal conditions
- providing:
 - dental care
 - gynaecological, pregnancy and childbirth support
 - medical care of rescued persons
 - minor surgical treatment
 - pain relief
- treating:
 - alcohol and drug abuse
 - sexually transmitted diseases
 - tropical and infectious diseases
- using disease prevention techniques including disinfection, de-infestation, de-ratting
- using sewing and clamping techniques.

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:

- alcohol and drug abuse
- care of:
 - head and spinal injuries
 - injuries of ear, nose, throat and eyes
 - external and internal bleeding
 - burns, scalds and frostbite
 - fractures, dislocations and muscular injuries
 - wounds, wound healing and infection
- death at sea
- dental care
- disease prevention including disinfection, de-infestation, de-ratting
- dressing and bandaging
- general principles of nursing
- gynaecology, pregnancy and childbirth
- hygiene
- international and national maritime medical regulations
- management of acute abdominal conditions
- medical care of rescued persons
- medical care of sick seafarers involving co-operation with port health authorities or out-patient wards in port
- medical conditions and emergencies
- minor surgical treatment
- nursing care
- pain relief
- radio medical advice
- quarantine regulations and required advices such as pratique, notification of disease on board
- sexually transmitted diseases
- techniques of sewing and clamping
- transportation of injured or ill persons including helicopter evacuation
- tropical and infectious diseases
- vaccinations
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARG001 Work effectively as part of a crew on a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to work effectively as a general purpose hand on a vessel up to 80 metres.

This unit applies to general purpose hands working in the maritime industry on vessels up to 80 metres as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

G – Teamwork

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 Perform routine workplace duties following simple written instructions

- 1.1 Routine work instructions and procedures are read and interpreted correctly
- 1.2 Appropriate lines of communication with supervisors and colleagues are identified and used
- 1.3 Routine work instructions and procedures are followed in sequence

	1.4	Clarification is sought from workplace supervisor when any instruction or procedure is not understood
2 Follow simple spoken instructions	2.1	Spoken instructions are interpreted correctly
	2.2	Instructions are responded to promptly
	2.3	Clarification is sought from workplace supervisor when any instruction is not understood
3 Communicate with other crew members	3.1	Constructive feedback is encouraged and acted upon
	3.2	All crew members are treated with respect, courtesy and sensitivity
	3.3	Cultural differences are considered and appropriate language is used in all verbal and non-verbal communication
	3.4	Communication is used to develop and maintain positive relationships, mutual trust and confidence
4 Complete workplace forms	4.1	Workplace forms are completed clearly and concisely within designated timeframes
	4.2	Assistance is sought to complete workplace forms when necessary
5 Complete work tasks	5.1	Tasks are completed within designated timeframes according to instructions
	5.2	Effective questioning is used to seek assistance from other crew members when difficulties arise in achieving allocated tasks
	5.3	Factors affecting work requirements are identified and appropriate action is taken
	5.4	Progress with task is communicated to supervisor as required

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.

Routine work instructions and procedures include one or more of the following:

- instruction manuals
- labels
- personnel information, notes, rosters
- signs and symbols
- weather information
- work health and safety (WHS)/occupational health and safety (OHS) policies, procedures and alerts

Workplace forms include one or more of the following:

- hazard/incident/accident report forms
- personnel forms
- safety reports
- telephone messages

Factors affecting work requirements include one or more of the following:

- changes to procedures
- competing work demands
- environmental factors such as weather
- equipment/technology breakdowns
- other work demands
- resource issues

Unit Mapping Information

This is a new unit. This unit is equivalent to MARG1001A Work effectively as part of a crew on a vessel up to 80 metres.

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 MARG001 Work effectively as part of a crew on a vessel up to 80 metres

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 on at least one occasion and include:

- being aware of own specific role and responsibilities
- communicating effectively in the workplace relevant to own work responsibilities
- communicating using maritime vocabulary
- completing relevant workplace documentation
- identifying work requirements
- planning work tasks
- processing basic workplace forms
- relating to people from diverse backgrounds using culturally appropriate language
- requesting advice, receiving feedback and working with others
- working as part of a team.

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:

- basic spelling, grammar and punctuation to complete basic workplace forms
- communication procedures relevant to the organisation and own work responsibilities
- standard marine communication phrases (SMCPs)
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARG002 Manage a small crew

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to lead and develop small crews.

This unit applies to people working in the maritime industry 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

G – Teamwork

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 Induct and train crew	1.1	Crew member is introduced to key personnel and areas on vessel
	1.2	Performance requirements and responsibilities of the position are explained
	1.3	Legislative requirements and organisational policies and procedures are explained
	1.4	Initial training in relevant safety management systems,

- equipment and work practices is arranged and conducted
- 1.5 Training opportunities for development of the individual's job role are identified
 - 1.6 Relevant documentation is completed and submitted to appropriate personnel
- 2 Allocate crew workload**
- 2.1 Current workload of crew is assessed
 - 2.2 Workload is scheduled effectively to facilitate operational efficiency of vessel
 - 2.3 Duties, rosters and responsibilities are assessed against and matched to crew capabilities according to legislative and organisational requirements
 - 2.4 Crew are allocated a workload priority
 - 2.5 Workload of crew is continuously assessed according to agreed objectives and timelines
- 3 Monitor crew performance**
- 3.1 Performance expectations are communicated clearly to crew and individual crew members
 - 3.2 Performance of crew and individuals is systemically monitored against defined measurable performance criteria to ensure satisfactory completion of assigned workloads
 - 3.3 Performance expectations are assessed objectively against workloads and crew and individual capabilities
 - 3.4 Strategies are developed to ensure crew and individuals are actively encouraged and supported in assessing their own competence and identifying their learning needs
- 4 Address performance related issues**
- 4.1 Systems are established to ensure efforts of crew are monitored, and formal and informal feedback is provided in a constructive manner
 - 4.2 Performance above expectations is identified and reinforced through recognition and continuous feedback
 - 4.3 Performance below expectations is identified and development plan for improved performance is negotiated, agreed on and documented according to organisational requirements
 - 4.4 Action plans for improving performance are established and monitored according to organisational requirements

5 Address issues and problems of crew and individual crew members	5.1	Potential and current issues and problems arising within crew and/or individuals are identified and acted on according to organisational and legislative requirements
	5.2	Advice, support and expertise is sought from appropriate personnel as required, to resolve issues and problems
	5.3	Issues and problems that impact on individual crew members are followed through and resolved with concerned individuals
6 Build support and commitment within crew	6.1	Organisational requirements are met through personal performance, behaviour and leadership, which serves as a positive role model for other crew members
	6.2	Own performance is monitored and adjusted to ensure it aligns with key performance indicators and organisational goals
	6.3	Crew members are treated in a fair and equal manner and individual differences are identified and accommodated
	6.4	Effective communication is developed and maintained with crew and management

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.

Organisational policies and procedures include	• anti-discrimination
	• complaint and grievance procedures

one or more of the following:

- culturally appropriate entitlements
- employment conditions
- equal opportunity
- induction and training
- performance measures
- professional development
- recruitment and selection
- work health and safety (WHS)/occupational health and safety (OHS)

Relevant documentation include one or more of the following:

- employee records
- job/position descriptions
- records of taxation and superannuation payments
- WHS/OHS records

Performance expectations include one or more of the following:

- documented key performance indicators (KPIs) for:
 - individuals
 - individuals and crew
- informal KPIs developed by Master for:
 - individuals
 - individuals and crew

Strategies include one or more of the following:

- coaching
- counselling
- disciplinary procedures
- discussions and meetings to resolve performance issues
- making adjustments to KPIs
- mentoring
- referral to more senior management/human resources support services
- shadowing
- training

Development plan includes one or more of the following:

- capacity for inserting ongoing evaluation, review and input
- codes of conduct
- crew competencies
- crew roles and responsibilities
- KPIs
- learning opportunities

- negotiated agreements with individual
- performance standards
- WHS/OHS requirements
- work allocation
- work outputs and processes

Potential and current, issues and problems include one or more of the following:

- appeals against formal decisions such as assessments
- bullying
- discrimination and harassment
- dispute between individuals or parties
- grievances
- injury rehabilitation
- perceived or actual relating to:
 - work roles, job design and allocation of duties
 - work performance of self and others
- prejudice or racial vilification
- promotions
- stress or personal problems

Appropriate personnel include one or more of the following:

- human resources manager and personnel
- management
- other crew members
- other Masters in the organisation
- union/employee representatives or groups

Unit Mapping Information

This is a new unit. This unit is equivalent to MARG4001A Manage a small crew.

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 MARG002 Manage a small crew

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 on at least one occasion and include:

- building and motivating teams
- coaching and mentoring others
- communicating and negotiating effectively
- communicating effectively with others as required
- counselling others and providing feedback as required
- developing and maintaining crew performance to enhance business operations
- developing effective planning documents
- leading others
- managing personnel effectively
- monitoring and reviewing activities, processes, performance and plans
- planning and organising work and activities
- producing accurate and reliable documentation
- relating to people from a range of social, cultural and ethnic backgrounds
- resolving conflict
- training others.

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:

- consultation and communication techniques and strategies
- key result areas of crew and organisation
- organisational policies and procedures
- principles and techniques involved in:
 - performance management systems
 - leadership and mentoring
- processes for monitoring team and own performance
- relevant industry awards and enterprise agreements
- relevant international maritime conventions

- relevant legislation especially in relation to work health and safety (WHS)/occupational health and safety (OHS), environmental issues, equal opportunity, industrial relations, unfair dismissal and anti-discrimination
- safety management systems
- staff counselling, grievance and disciplinary procedures.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARG003 Manage an engine room and small engineering team

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to lead and develop a small engineering team.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

G – Teamwork

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 Organise engine room for departure

1.1	Fuels, lubricating oil, liquefied petroleum gas (LPG) and refrigeration gas required for proposed voyage are obtained
1.2	Flammable and explosive materials are stowed and managed according to regulatory and organisational requirements
1.3	Planned maintenance tasks to be completed during proposed voyage are verified

	1.4	Spares and consumables required for proposed voyage are acquired
	1.5	Work health and safety (WHS)/occupational health and safety (OHS) hazards in engine room are identified, risks are assessed and corrective actions are taken and recorded according to organisational practices
2 Manage daily engine room routine	2.1	Engine room routine is organised and duties for engineering team are defined
	2.2	WHS/OHS roles and responsibilities of engineering team are defined
	2.3	WHS/OHS procedures are communicated to engine room crew
	2.4	WHS/OHS issues raised are acknowledged and resolved promptly
	2.5	Permits for hot work, confined space entry and other high risk activities are completed according to organisational and regulatory requirements
	2.6	Engineering team members are allocated daily maintenance tasks according to planned maintenance system or breakdown maintenance
	2.7	Procedures for collecting and sorting engine room waste from cleaning and maintenance tasks are defined and communicated to engineering team
3 Manage engineering team	3.1	Performance expectations are communicated clearly to engineering team
	3.2	Performance expectations are assessed objectively against workloads and engineering team capabilities to ensure satisfactory completion of assigned tasks
	3.3	Potential and current issues and problems arising within crew and/or individuals are identified and acted on according to organisational and legislative requirements
	3.4	Effective communication is developed and maintained with team and management
4 Manage engineering procedures in port	4.1	Planned and breakdown maintenance activities to be conducted in port are arranged to facilitate operational efficiency of vessel

- 4.2 Permits for hot work, confined space entry and other high risk activities are completed according to organisational and regulatory requirements
 - 4.3 Sound business relationships with contractors are established and maintained to ensure effective communication and early identification of potential service delivery problems
 - 4.4 Contractual disputes with contractors that arise are managed according to contractual requirements, using established mediation mechanisms
 - 4.5 Removal of sludge, sewage and engine room waste is arranged
 - 4.6 Procedures for removal of sludge, sewage and engine room waste are followed according to regulatory requirements and organisational procedures
- 5 Manage engineering emergencies**
- 5.1 Information is received regarding scope and severity of emergency
 - 5.2 Information is analysed to determine appropriate response
 - 5.3 WHS/OHS risks are identified and action is taken according to organisational procedures
 - 5.4 Actions are taken to reduce effect of incident according to organisational procedures
 - 5.5 Incident is monitored for any changes and appropriate responses are taken according to organisational procedures
 - 5.6 Communications are established with support services and relevant stakeholders, where appropriate
 - 5.7 Reports and debriefings are completed 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.

Flammable and explosive materials include one or more of the following:

- fuels
- LPG
- lubricating oils
- refrigeration gas

Engine room routine include one or more of the following:

- completing log book entries
- monitoring of equipment in engine room
- regular inspection of engine room
- responding to alarms
- watchkeeping arrangements

Performance expectations include one or more of the following:

- compliance with duty statements
- personal appraisal reports

Potential and current issues and problems include one or more of the following:

- bullying
- discrimination and harassment
- disputes between individuals or parties
- grievances
- injury rehabilitation
- perceived or actual issues and problems relating to:
 - work roles, job design and allocation of duties
 - work performance of self and others
- prejudice or racial vilification
- stress or personal problems

Emergencies include one

- accidental release of refrigeration gas in confined space
- explosion

or more of the following:

- fire
- flooding
- loss of electrical supply
- major failure of propulsion engine

Unit Mapping Information

This is a new unit. This unit is equivalent to MARG4002A Manage an engine room and small engineering team.

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 MARG003 Manage an engine room and small engineering team

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 on at least one occasion and include:

- communicating effectively with people from a range of social, cultural and ethnic backgrounds
- counselling team members and providing feedback
- developing effective planning documents
- displaying sound personnel management
- leading team members
- monitoring and reviewing activity
- negotiating effectively
- planning and organising activity
- providing high quality reports
- reading and interpreting maritime regulations, rules and instructions
- reading, interpreting and applying manufacturer instructions including all work health and safety (WHS)/occupational health and safety (OHS) requirements and safety data sheets (SDS)/material safety data sheets (MSDS)
- resolving conflict
- writing reports.

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:

- consultation and communication techniques and strategies
- hazards associated with flammable/explosive materials
- hazards of refrigeration gases including accidental release in a confined space
- key result areas of the crew and the organisation
- organisational policies and procedures
- principles and techniques involved in:
 - performance management systems
 - leadership and mentoring
- processes for monitoring crew and own performance

- relevant legislation especially in regard to WHS/OHS, environmental issues, equal opportunity, industrial relations, unfair dismissal and anti-discrimination
- regulations for stowing and managing flammable/explosive materials including:
 - diesel
 - petrol
 - liquefied petroleum gas (LPG)
 - refrigerant gases
 - lubricants
- requirements for confined space entry and hot work permits
- safety management systems
- testing of LPG detectors.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARG004 Provide leadership to crew

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply leadership and team working skills.

This unit applies to a Watchkeeper Deck, Master up to 500 gross tonnage and Master up to 80 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

G – Teamwork

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 Allocate duties

1.1	Workload is scheduled effectively to facilitate vessel operational efficiency
1.2	Duties, rosters and responsibilities are assessed against and matched to crew capabilities and according to legislative and organisational requirements
1.3	Crew are allocated workload priority and performance expectations are communicated clearly

- 1.4 Workload of crew is continuously assessed according to agreed objectives and timelines
 - 1.5 Performance of crew and individuals is systemically monitored against defined measurable performance criteria to ensure satisfactory completion of assigned workloads
 - 1.6 Performance above expectations is identified and reinforced through recognition and continuous feedback
 - 1.7 Performance below expectations is identified and development plan for improved performance is negotiated, agreed on and documented according to organisational requirements
 - 1.8 Potential and current issues and problems arising within the crew and/or individuals are identified and acted on according to organisational and legislative requirements
- 2 Provide learning and development activities**
- 2.1 Action plan to meet individual and group learning and development needs is prepared
 - 2.2 Individuals are supported to identify their specific learning and development needs
 - 2.3 Crew members are encouraged and supported to take advantage of learning and development opportunities according to their needs and organisational requirements
 - 2.4 On-the-job learning opportunities are provided according to individual needs and to the required standard
 - 2.5 Crew members are encouraged and supported in applying new skills and knowledge in the workplace
- 3 Communicate effectively with crew and stakeholders**
- 3.1 Interpersonal skills and communication techniques are used to facilitate open communication within crew, ensure understanding and encourage accurate exchange of information
 - 3.2 Meetings and briefings are conducted to maintain understanding and support with crew and stakeholders
 - 3.3 Barriers to effective cross-cultural communication are identified and addressed to maintain effective relationships
 - 3.4 Positive involvement and contributions are encouraged from all crew members

- 3.5 Communications are clear and accurate to ensure that information can be easily understood and acted upon
- 3.6 Strategies for resolving differences are used to negotiate issues and problems
- 3.7 Communication is used to develop and maintain positive relationships, mutual trust and confidence
- 4 Provide leadership within the crew**
 - 4.1 Crew members are provided with the support, leadership and advice necessary to perform work safely and effectively
 - 4.2 Assistance is provided to crew members to accomplish teamwork and achieve organisational goals
 - 4.3 Conflict situations in crew are identified and conflict resolution strategies applied
 - 4.4 Leadership and guidance strategies are varied to meet changing priorities and situations, taking into account the differing needs and skills of individuals and the requirements of the tasks
- 5 Make effective decisions**
 - 5.1 Information is gathered and analysed to generate a range of options
 - 5.2 Decisions made are the most effective for the situation based on sufficient, valid and reliable information
 - 5.3 Decisions made are consistent with personal and professional values, ethics and regulatory obligations
 - 5.4 Consultative and participative decision making is used in implementing and reviewing the work of the crew and the distribution of responsibilities
 - 5.5 Needs and expectations of crew and the organisation are taken into account through decision making
 - 5.6 Decision making is undertaken according to risk management plans and within appropriate timeframes
 - 5.7 Effectiveness of decisions is evaluated to improve future decision making

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.

Performance expectations include one or more of the following:	• documented key performance indicators (KPIs) for: • individuals • individuals and crew • informal KPIs developed by the Master for: • individuals • individuals and crew
Development plan includes one or more of the following:	• capacity for inserting ongoing evaluation, review and input • codes of conduct • crew competencies • crew roles and responsibilities • KPIs • learning opportunities • negotiated agreement with individual • performance standards • work allocation • work health and safety (WHS)/occupational health and safety (OHS) requirements • work outputs and processes
Potential and current issues and problems include one or more of the	• appeals against formal decisions such as assessments • bullying • discrimination and harassment

following:

- dispute between individuals or parties
- grievances
- injury rehabilitation
- perceived or actual relating to work:
 - roles, job design and allocation of duties
 - performance of self and others
- prejudice or racial vilification
- promotions
- stress or personal problems

Learning and development opportunities include one or more of the following:

- career pathways
- coaching
- conference and seminar attendance
- external study
- formal course participation
- induction
- in-house training programs
- job rotation
- mentoring
- on-the-job training
- secondment

Interpersonal skills and communication techniques include one or more of the following:

- active listening
- constructive feedback
- control of voice and body language
- flexibility and willingness to negotiate
- non-verbal communication
- presenting options and consequences
- paraphrasing
- reflecting and summarising
- speaking clearly and concisely
- seeking feedback to check understanding
- showing awareness of cultural and social differences
- using language sensitively
- using positive, confident and cooperative language

Stakeholders include one or more of the following :

- coast stations
- Master
- other ships
- vessel traffic service (VTS) centres

- Barriers to effective cross-cultural communication include one or more of the following:
- assumptions
 - cultural
 - first or preferred language
 - level of skill and knowledge
 - power imbalance
 - racist and prejudiced attitudes
 - socioeconomic
 - stereotypes and generalisations
 - structural
- Teamwork includes one or more of the following:
- advantages and disadvantages
 - individual and group behaviour
 - team building
 - team problem solving
 - types of groups
- Organisational goals include one or more of the following:
- client service standards
 - environmental management
 - organisational service standards
 - WHS/OHS
- Leadership and guidance strategies include one or more of the following:
- delegation
 - empowerment
 - job design
 - motivation
 - process theories

Unit Mapping Information

This is a new unit. This unit is equivalent to MARG5001A Provide leadership to crew.

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 MARG004 Provide leadership to crew

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 on at least one occasion and include:

- allocating, assigning and prioritising resources
- applying:
 - decision-making techniques
 - assertiveness and leadership
- communicating:
 - effectively on board and ashore
 - with other ships, coast stations and VTS centres
 - to perform officer duties, which may include communicating with a multilingual crew
- demonstrating effective leadership behaviour and teamwork techniques
- developing effective planning documents
- ensuring that communications are clear and understood
- sharing an accurate understanding of current and predicted vessel status, operational status and external environment with necessary crew members
- using and understanding the International Maritime Organization Standard Marine Communication Phrases (IMO SMCP).

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:

- allocation, assignment and prioritisation of resources
- assertiveness and leadership including motivation
- communication techniques and strategies
- decision-making techniques
- effective communication on board and ashore
- English language to:
 - communicate with other ships, coast stations and VTS centres
 - perform officer's duties, which may include communicating with a multilingual crew
- principles and techniques involved in:

- performance management systems
- assertiveness, leadership, motivation
- teamwork
- risk management as the process of identifying potential negative events and developing plans to mitigate or minimise the likelihood of the negative event occurring and/or the consequences, if it does occur.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH001 Plan and navigate a passage for a vessel up to 12 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to conduct the passage of a vessel up to 12 metres within the 15 nautical mile (nm) limit; it includes using the range of equipment found on a vessel to plan and safely conduct the passage.

This unit applies to people working in the maritime industry as a Coxswain Grade 1 on a range of vessels up to 12 metres within the 15 nm limit.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

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 passage

- 1.1 Appropriate charts and publications are accessed and checked for currency
- 1.2 Destination is identified, and course and waypoints are plotted
- 1.3 Estimated time of arrival (ETA) at waypoints and final

destination are calculated

- 1.4 Safe passage is plotted to comply with all navigational buoys, marks and beacons
- 1.5 Navigational hazards are identified to avoid dangers to vessel
- 1.6 Weather information is accessed to determine expected weather pattern for intended passage
- 1.7 Proposed course is modified as necessary, to meet expected weather conditions
- 1.8 Fuel consumption for passage, including a reserve, is calculated

2 Conduct a pre-departure check

- 2.1 Propulsion equipment and alarms are tested for serviceability and vessel hull is checked for seaworthiness
- 2.2 Navigation equipment and alarms are checked to ensure they are in proper working condition and set for the passage
- 2.3 Navigation equipment is checked for errors and allowances are made in planning the passage
- 2.4 Fuel is checked to ensure there is adequate fuel on board for intended passage
- 2.5 Safety equipment is checked for compliance with legislation
- 2.6 Communications equipment is checked to ensure it is in proper working condition
- 2.7 Anchoring and mooring equipment is checked to ensure it is adequate and in good condition
- 2.8 Vessel and equipment are secured for sea

3 Conduct passage

- 3.1 Local authorities are advised of departure and passage plan
- 3.2 Vessel is steered and propulsion equipment is operated in a safe and controlled manner to complete pre-planned course
- 3.3 Pilotage techniques and navigational equipment are used to monitor vessel position and maintain vessel in safe waters at all times
- 3.4 Errors detected with navigational equipment are corrected to maintain planned passage

- 3.5 Navigational buoys, marks and beacons are identified and complied with
- 3.6 Situational awareness is maintained to avoid navigational hazards and to comply with regulations for prevention of collision at sea
- 3.7 Weather and sea conditions are monitored during passage and correct adjustments are made for changing conditions
- 4 Complete passage**
 - 4.1 Local authority is advised of completion of passage
 - 4.2 Vessel is checked to ensure it is securely moored
 - 4.3 Propulsion equipment is checked to ensure it is safely shut down and secured
 - 4.4 Navigational equipment is switched off

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.

- Charts and publications must include:
- electronic charts
 - notice to mariners
 - paper charts
 - tide tables

- Navigational hazards include one or more of the
- restricted visibility
 - shallow water

following:

- traffic
- unlit beacons

Propulsion equipment includes one or more of the following:

- inboard engine
- outboard engine

Alarms include one or more of the following:

- bilge alarms
- depth alarms
- engine alarms
- off-course alarms
- radar range alarms

Navigation equipment includes one or more of the following:

- automatic identification systems (AISs)
- compass
- echo sounder
- electronic chart systems (ECSs) and plotter
- paper charts
- global positioning system (GPS)
- radar

Safety equipment includes one or more of the following:

- distress flares/pyrotechnics
- electronic position indicating radio beacon (EPIRB)
- firefighting equipment
- life jackets
- life rafts and hydrostatic release systems

Communications equipment includes one of the following:

- HF radio
- VHF radio

Anchoring and mooring equipment includes one or more of the following:

- anchor
- mooring lines
- sea anchors

- Passage plan must include:
- anticipated weather conditions
 - courses to steer or knowledge of navigation markers during the passage
 - depths of water throughout the passage
 - ETA at destination
 - tidal information

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH2001A Plan and navigate a passage for a vessel up to 12 metres.

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 MARH001 Plan and navigate a passage for a vessel up to 12 metres

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 on at least one occasion and include:

- applying International Regulations for Preventing Collisions at Sea
- applying weather information during passage planning and explaining expected weather patterns
- correctly interpreting weather information received
- establishing relationship between degrees and minutes of latitude, with nautical miles
- explaining impact of tidal variation on chart depths
- identifying and complying with all navigational buoys, marks and beacons
- identifying and responding to relevant proximity alarms
- identifying:
 - courses to steer between turning points
 - navigational hazards
 - times and heights of high and low water from local tide tables
- obtaining weather information applicable to an intended passage
- plotting the position derived from global positioning system (GPS) and explaining the dangers of reliance on the use of GPS in coastal areas
- plotting visual bearings on a chart to derive a position
- relating information in forecasts to conditions expected for small vessels
- specifying fuel consumption and time at turning points
- steering a pre-planned course.

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:

- action to be taken on receiving adverse weather report and on encountering heavy weather
- appreciation of manoeuvring difficulties of larger vessels
- basic information contained in a navigation chart
- basic meteorological terms
- basic pilotage techniques

- chart information (symbols and abbreviations)
- coastal features
- cyclonic and storm development
- dangers to navigation
- electronic aids and their limitations including sourcing and applying chart corrections
- local weather patterns including features on a synoptic weather chart
- propulsion equipment
- radio equipment
- sources of weather reports and warnings
- speed, distance and time calculations
- types of reports available
- use of a compass and compass errors
- use of local tide tables
- 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.

(NOTE: simulator is only appropriate for planning and navigation; simulator IS NOT appropriate for vessel handling.)

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH002 Apply weather information when navigating inland waters as Master

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to predict meteorological conditions and apply them to ensure the safe navigation of a vessel. It includes interpreting and applying information obtained from observations, reports and instruments and forecasting weather for an intended inland waters passage using all available data.

This unit applies to those working in the capacity of a Master Inland Waters on any commercial vessel up to 24 metres engaged in inland waters navigation.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

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 Obtain weather information

1.1	Relevant weather forecasts are obtained from a range of sources and correctly interpreted
1.2	Weather conditions are observed and correctly interpreted according to established nautical and meteorological practice

	1.3	Basic measurements of meteorological conditions are correctly made and recorded using established procedures
	1.4	Relevant meteorological charts, publications and related documentation are obtained, used, updated, stored and maintained
2 Apply weather data to safe navigation	2.1	Weather condition hazards relevant to a proposed voyage are identified using relevant forecasts based on interpretation of meteorological observations, reports and measurements
	2.2	Voyage is modified as required to take into account weather and water condition hazards according to established navigational practice and operational instructions
3 Maintain records of weather and oceanographic information	3.1	Meteorological measurements, observations, reports and forecasts are recorded and stored according to organisational procedures and regulatory requirements
	3.2	Actions taken to maintain safety of navigation and to minimise risk to safety of vessel as a result of weather and oceanographic forecasts, are documented 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.

Sources include one or more of the following:

- charts
- instruments
- observations

- reports
- satellite images

Documentation include one or more of the following:

- meteorological publications
- navigational charts of inland waterways
- notices and instructions of relevant maritime authorities
- operational orders
- organisational procedures
- relevant sections of state and territory marine regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
- vessel log
- vessel manufacturer instructions and recommended procedures
- weather reports, charts and satellite images

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH3001A Apply weather information when navigating inland waters as Master.

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 MARH002 Apply weather information when navigating inland waters as Master

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 on at least one occasion and include:

- completing required records and documentation
- identifying and evaluating weather forecasting problems and determining appropriate solutions
- navigating under a range of conditions (day and night, clear visibility and restricted visibility)
- reading, interpreting and applying weather information
- recognising problems that may occur when interpreting and applying weather information to navigation and taking appropriate action
- selecting and using relevant instruments and equipment according to instructions
- using relevant communication skills when navigating a small vessel as Master
- using weather forecasts to ensure safe navigation.

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:

- basic principles and procedures interpreting meteorological information
- effects on navigation and vessel handling of wind, currents and bottom topography
- maritime communication techniques
- meteorological and oceanographic parameters:
 - atmospheric pressure
 - pressure gradient and isobar patterns
 - air temperature
 - relative humidity
 - wind strength
 - wind direction
 - visibility (in conditions of fog, mist, rain and snow)
 - cloud

- problems in forecasting weather information to navigate a vessel and appropriate action and solutions
- procedures for applying forecast of likely weather and water conditions to the development of a typical voyage
- procedures to be followed during gale conditions and cyclones, including the means of securing a vessel in a cyclone mooring
- principles of weather forecasting using information obtained from observations, reports and instruments, including:
 - vertical division of the atmosphere
 - air masses and fronts
 - cloud classifications
 - heat exchange process
 - synoptic chart analysis
 - pressure systems, cold and warm fronts
 - cyclones, storms and gales
 - tropical meteorology
 - sources of weather data
- relevant sections of state and territory regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code dealing with responsibilities of a Master Inland Waters
- sources of weather reports and methods for their interpretation.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH003 Manage and maintain a navigational watch on board vessels up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply the recommended principles to be observed in managing and maintaining a navigational watch on board vessels up to 80 metres.

This unit applies to people working in the maritime industry 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

H – Navigation

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 Maintain watch on bridge when berthed or anchored	1.1	Checks and inspections are scheduled to comply with organisational procedures and regulatory requirements	
	1.2	Appropriate action is taken in the event of irregularities or abnormal conditions to maximise the safety and integrity of vessel	

	1.3	Restrictions on access to vessel by non-authorised persons are followed according to organisational procedures and regulatory requirements
	1.4	Internal and external communications systems are used according to organisational procedures
2 Maintain watch on bridge when at sea	2.1	Proper watch is maintained at all times according to organisational procedures and regulatory requirements
	2.2	Lights, shapes and sound signals are correctly recognised and acted upon
	2.3	Frequency and extent of monitoring traffic, vessel and environment are scheduled to conform with organisational procedures and regulatory requirements
	2.4	Wheelhouse communication is maintained with other crew members on matters relevant to safety and integrity of vessel
	2.5	Clear and concise wheelhouse communications are maintained and clarification is sought from or given to other crew members when watch information or instructions are not clearly understood
	2.6	Internal and external communications systems are used according to organisational procedures
	2.7	Log and record books are maintained according to regulatory requirements and organisational procedures
3 Respond to potential emergency situations	3.1	Watchkeeping problems and emergency situations are promptly reported to crew according to organisational procedures
	3.2	Distress signals are recognised and acted upon
	3.3	Appropriate action is taken to handle watchkeeping problems and emergency situations according to organisational procedures and regulatory requirements
4 Manage crew performing watchkeeping and lookout duties	4.1	Watchkeeping schedule is developed with due regard to crew qualifications, experience and organisational procedures
	4.2	Instructions are provided on watchkeeping and lookout requirements in relation to monitoring traffic, vessel and environment
	4.3	Clear and concise roles and responsibilities of watchkeeping

team are established

- 4.4 Effective communication is maintained with crew on matters relevant to safety and integrity of vessel
- 4.5 Fatigue management strategies are correctly applied in allocating watchkeeping and lookout duties

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.

Scheduled includes one or more of the following:

- coverage
- frequency
- timing

Irregularities or abnormal conditions include one or more of the following:

- fog and restricted visibility
- heavy weather, including cyclones

Lights, shapes and sound signals include:

- alternative power source for lights
- day time shapes for a vessel
- emergency lights
- means of making sound signals for a vessel up to 80 metres
- navigation lights

Wheelhouse communication includes one or more of the following:

- verbal instruction relating to watchkeeping duties
- written Master instructions

Internal and external communications systems include one or more of the following:

- global maritime distress and safety system (GMDSS) equipment
- handheld radios
- international single letter code flags
- MF and HF radios
- VHF radios

Watchkeeping problems include one or more of the following:

- dragging of anchor
- failure of bridge equipment, steering equipment, navigational lights
- loss of main engines or propulsion controls
- loss of mooring lines or winches when berthing
- machinery and bilge alarms

Emergency situations include one or more of the following:

- cargo shift
- collision
- fire
- fouled hawse
- grounding
- injured crew or passenger
- loss of watertight integrity
- missing crew or passenger
- person overboard
- reception of a distress signal
- retrieval of survivors from the water
- synchronous rolling

Fatigue management strategies must include:

- maintaining personal fitness and health and appropriate dietary habits
- observing appropriate hours of duty in a 24 hour period
- observing policy concerning alcohol/drug use prior to watchkeeping duties
- recognising symptoms of fatigue

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH3002A Manage and maintain a navigational watch on board vessels up to 80 metres.

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 MARH003 Manage and maintain a navigational watch on board vessels up to 80 metres

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 on at least one occasion and include:

- communicating effectively with others about watchkeeping issues, arrangements and requirements
- identifying and solving problems that may arise during watchkeeping duties
- interpreting and implementing procedures relevant to the role and responsibilities of watchkeeper
- maintaining situational awareness
- monitoring and anticipating hazards and risks that may arise during watchkeeping duties and taking appropriate action
- selecting and using appropriate internal and external communications equipment during watchkeeping duties
- using bridge equipment in normal and emergency situations on vessels up to 80 metres.

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:

- application and intent of the International Ship and Port Facility Security (ISPS) Code as it applies to Australian coastal vessels and ports
- bridge instrumentation, controls and alarms relevant to the function of watchkeeper
- content, application and intent of the International Regulations for Preventing Collisions at Sea
- fatigue management principles and techniques
- functions and responsibilities of the wheelhouse team on board a vessel
- general provisions on ship routing
- International Association of Lighthouse Authorities (IALA) buoyage system A
- International Aeronautical and Maritime Search and Rescue Manual (IAMSAR)
- International Code of Signals
- maritime communication techniques on board a vessel
- navigational hazards and implications for watchkeeping
- procedures for the relief, maintenance and handover of a watch

- procedures for the use of internal communications and alarm systems
- relevant sections of state and territory marine regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
- typical watchkeeping problems and emergency situations, and appropriate actions and solutions
- vessel traffic services
- wheelhouse procedures on board a vessel
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH004 Plan and navigate a passage for a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to plan and safely navigate a vessel up to 80 metres using a range of wheelhouse equipment and to interpret available meteorological information to inform passage planning and navigation.

This unit applies to people working in the maritime industry 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

H – Navigation

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 passage

- 1.1 Navigational charts, nautical publications and related documentation are accessed and checked for currency
- 1.2 Documentation is used to identify navigational hazards relevant to proposed voyage
- 1.3 Route for voyage is determined and critical points along

- proposed route of voyage are identified and plotted
- 1.4 Potential navigational contingencies and problems along planned route are identified and appropriate strategies for dealing with them are developed and recorded
 - 1.5 Weather forecasts are obtained and interpreted, and weather and sea condition hazards relevant to proposed voyage are identified prior to departure
 - 1.6 Route is modified as required to take into account weather and sea condition hazards
 - 1.7 Planned route for voyage and strategies for dealing with critical situations and contingencies along route are recorded
- 2 Conduct a pre-departure check**
- 2.1 Propulsion steering equipment and alarms are tested for serviceability and vessel hull is checked for seaworthiness
 - 2.2 Wheelhouse equipment and alarms are checked to ensure they are in proper working condition and set for passage
 - 2.3 Wheelhouse equipment is checked for errors and allowances are made in planning passage
 - 2.4 Fuel is checked to ensure that there is adequate fuel, including a reserve, on board for the intended passage
 - 2.5 Safety equipment is checked for compliance with relevant legislation
 - 2.6 Communications equipment is checked to ensure it is in proper working condition
 - 2.7 Anchoring and mooring equipment is checked to ensure it is in proper working condition
 - 2.8 Vessel and equipment are secured for sea
 - 2.9 Latest weather information is obtained and interpreted, and proposed route is modified as required to take into account weather and sea condition hazards
- 3 Conduct passage**
- 3.1 Local authorities are advised of departure and passage plan
 - 3.2 Mode of steering is selected appropriate for prevailing weather, sea and traffic conditions, and intended manoeuvres
 - 3.3 Weather forecasts and observations of sea and weather conditions are used to determine vessel speed and direction

- 3.4 Information from wheelhouse equipment is interpreted to identify navigational hazards and fix vessel position
- 3.5 Alterations to vessel course or speed are made to meet prevailing circumstances and changing conditions
- 3.6 Navigational manoeuvres are conducted within safe operational limits of vessel
- 3.7 Details of passage are recorded in vessel log according to regulations
- 4 Fix vessel position**
 - 4.1 Primary position fixing method is selected according to navigational principles and prevailing conditions
 - 4.2 Position is fixed using selected method and information derived from relevant wheelhouse equipment
 - 4.3 Position is recorded according to regulations
 - 4.4 Fixes are taken at time intervals appropriate for prevailing navigational conditions
 - 4.5 Performance checks of position fixing instruments and wheelhouse equipment are carried out according to organisational procedures and manufacturer instructions

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.

Navigational charts, nautical publications and related documentation include one or more of the following:

- electronic chart display and information systems (ECDISs)
- Notice to Mariners
- paper charts
- temporary warning notices
- tide tables
- weather reports and warnings

Navigational hazards include one or more of the following:

- ice
- restricted visibility
- shoals and reefs
- traffic
- unlit beacons

Weather includes one or more of the following:

- air masses and fronts
- cloud classifications
- cyclones, storms and gales
- effects of weather on predicted tidal information
- heat exchange process
- ocean currents
- pressure systems, cold and warm fronts
- sea state
- synoptic chart analysis
- tropical meteorology
- vertical division of atmosphere
- weather data provided by shipboard instruments

Propulsion steering equipment and alarms include one or more of the following:

- engine alarms
- inboard engines, petrol and diesel
- jet propulsion
- off-course alarms
- outboard engines, petrol and diesel
- radar range alarms

Wheelhouse equipment includes one or more of the following:

- alarm devices including off-course and watch alarms
- automatic identification system (AIS)
- automatic pilot
- azimuth mirrors
- bilge alarms

- coverage areas
- depth alarms
- differential global positioning system (DGPS)
- echo sounder
- electronic charts
- global positioning system (GPS)
- hyperbolic systems
- magnetic and gyro compasses
- plotters
- radar
- satellite technology
- speed and distance log

Safety equipment must include:

- distress flares/pyrotechnics
- electronic position indicating radio beacon (EPIRB)
- firefighting equipment
- life jackets
- life rafts and hydrostatic release systems
- search and rescue transponder (SART)

Communications equipment includes one or more of the following:

- HF radio
- VHF radio

Anchoring and mooring equipment includes one or more of the following:

- anchor
- mooring lines
- sea anchors

Passage plan must include:

- anticipated weather conditions
- completed Australian Ship Reporting System (AUSREP) reports as applicable
- courses to steer or knowledge of navigation markers during passage
- depths of water throughout passage
- estimated time of arrival (ETA) at destination
- tidal information

Mode of steering includes

- automatic pilot

one or more of the following:

- electric systems
- hydraulic systems

Conditions include one or more of the following:

- buoyage
- overall passage plan requirements
- prevailing weather and sea conditions
- proximity and course of other vessels
- relevant navigational hazards
- signage

Primary position fixing method include one or more of the following:

- radar ranges or bearings
- running fix
- simultaneous bearings or transits of coastal features
- use of electronic navigational systems
- use of soundings to assist in determining position

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH3003A Plan and navigate a passage for a vessel up to 80 metres.

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 MARH004 Plan and navigate a passage for a vessel up to 80 metres

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 on at least one occasion and include:

- applying hazard avoidance techniques in passage planning
- applying variation and deviation to compass courses
- completing required records relevant to planning and navigating a passage
- developing effective planning documents
- determining dipping and rising distances of lights
- estimating position using dead reckoning
- interpreting and applying tidal stream data
- lay off a safe course on a chart
- maintaining situational awareness
- observing and interpreting weather and oceanographic conditions
- producing accurate and reliable documentation
- reading and interpreting:
 - charts and other published information relevant to planning and navigating a passage
 - instrument and equipment readings relevant to planning and navigating a passage
 - weather information and oceanographic reports
- reading aneroid barometer and interpreting information obtained
- recognising and correctly responding to cross-track error resulting from effects of tide and wind
- recognising faulty equipment and taking appropriate action according to operating instructions
- recognising problems that may be experienced when planning and navigating a passage
- selecting and using relevant equipment required for planning and navigating a passage
- using parallel indexing to maintain a required distance of a point of land
- using meteorological information available.

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:

- Australian or local tide tables and sailing directions
- basic meteorological terms
- characteristics of various weather systems affecting Australian coast
- charted information including that in the title block, Zone Of Confidence diagrams and datums
- compass error from transit bearings or by bearings taken from a known position
- determining times and heights of:
 - high and low water from Australian or local tide tables for any port and the relevance of chart datum
 - tides at standard and secondary ports for any state of tide
- differences between rhumb and great circle sailings
- effects of current and of leeway on course and speed of vessel (without calculations) and recognising the presence of either or both factors
- finding variation from chart
- fixing vessel position by:
 - simultaneous bearings, transits of coastal features, and by running fix
 - radar ranges and bearings
- information given on a chart or plan, particularly buoyage, hazards to navigation, depth and nature of bottom, lights, tides and tidal streams
- interpreting set and drift of current from information available on chart
- measuring distance on a chart
- meteorological instruments and their use
- obtaining bearings on small vessels
- recognition of coastal features
- relating coastal features to a chart
- relationship between:
 - latitude and longitude
 - compass, magnetic, true and gyro courses and bearings
- relative bearings
- selection of suitable:
 - anchorage or shelter
 - points for bearings
- sound signals such as:
 - appropriate signals for alteration of course to port or starboard
 - danger warnings
 - moving astern
- sources of weather forecasts and interpretation of that information in simple terms
- traffic separation schemes
- tropical revolving storms and the weather associated with such storms
- use and application of ship routing services
- use and limitations on use of electronic position fixing equipment found on small vessels
- use of a deviation card without mathematical interpolation

- using a single position line
- using modern electronic navigational aids to determine vessel position
- using rhumb line navigation
- using soundings in determining position
- using terrestrial observations to determine vessel position individually or in combination with other methods
- weather conditions affecting Australian coast and liable to endanger vessel
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH005 Use wheelhouse equipment for safe navigation

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to maintain safe navigation of a commercial vessel through the use of radar and other equipment used for the navigation of a vessel.

This unit applies to people working in the maritime industry 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

H – Navigation

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 Set up wheelhouse navigation equipment

1.1	Wheelhouse navigation equipment is initialised and displays are set up and maintained
1.2	Operational performance and accuracy of wheelhouse equipment is confirmed and appropriate action is taken when performance is out of limits
1.3	Misrepresentation of information is detected and corrected or

- allowed for
- 2 Use radar to navigate safely**
 - 2.1 Radar is operated according to manufacturer instructions to produce data on position and speed of vessel, other vessels and fixed objects
 - 2.2 Radar plot is constructed on a radar plotting sheet or automatic plotting devices are initialised
 - 2.3 Systematic radar observations of vessels in the vicinity are made where there is a risk of collision
 - 2.4 Radar data is used to obtain a position fix for vessel using electronic bearing lines and variable range markers
 - 2.5 Radar bearings are corrected for vessel heading and compass error as appropriate
 - 2.6 Radar plotting data is analysed to anticipate potential collisions
 - 2.7 Analysis is used to make informed command decisions on action needed to avoid collisions
 - 3 Use wheelhouse navigation equipment**
 - 3.1 Wheelhouse navigation equipment is safely and efficiently used to conduct navigation of the vessel
 - 3.2 Position of vessel is monitored during voyage to ensure planned passage is followed
 - 3.3 Movement of vessels in the vicinity is monitored to ensure collision situations do not occur
 - 3.4 Wheelhouse navigation equipment is maintained according to manufacturer requirements and organisational procedures
 - 4 Maintain navigational records**
 - 4.1 Navigational data produced by wheelhouse navigation equipment that should be retained to conform with organisational procedures and regulatory requirements is identified
 - 4.2 Navigational data is stored electronically or in hard copy as required by organisational procedures and regulatory requirements
 - 4.3 Security and access requirements for data are adhered to 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.

Wheelhouse navigation equipment includes one or more of the following:	• AIS • alarm devices including off-course and watch alarms • automatic pilot • azimuth mirrors • bottom logs • coverage areas • differential global positioning system (DGPS) • echo sounder • electronic charts • global positioning system (GPS) • hyperbolic systems • magnetic and gyro compasses • plotters • radar • satellite technology
Misrepresentation of information includes one or more of the following	• compass errors • false echoes • GPS and DGPS errors • incorrect setting up of electronic chart system (ECS) or electronic chart display and information system (ECDIS) • incorrect setting up of GPS • incorrect radar settings for heading marker and range marker • sea returns

Navigation data includes one or more of the following:

- navigation safety warning
- recording courses steered
- weather and oceanographic reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH3004A Use wheelhouse equipment for safe navigation.

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 MARH005 Use wheelhouse equipment for safe navigation

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 on at least one occasion and include:

- interpreting radar displays and indications
- operating marine radar systems and equipment on a vessel
- operating marine radar systems and equipment on an automatic radar plotting aid (ARPA) system
- operating other electronic navigational instruments and equipment on a vessel
- reading and interpreting service manuals and instructions for radar and other electronic navigational aids
- recognising faulty radar equipment and taking appropriate action
- recognising problems when using radar and other electronic navigational aids to maintain safe navigation and taking appropriate action
- recognising radar display of search and rescue transponders (SART) and racon signals.

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:

- different types of navigational aids, including their features, key applications and operational characteristics
- limitations and potential errors associated with each type of electronic navigational aid
- methods for the interpretation and analysis of navigational data produced by radar and other electronic navigational instruments
- procedures for the initialisation and operation of radar and other electronic navigational instruments
- procedures for the use of data generated by radar and other electronic navigational instruments
- relevant sections of state and territory regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code dealing with navigational equipment and the responsibilities of a Master or Deck Officer
- techniques for the use of radar and other electronic navigational instruments
- terminology and principles of operation of radar and other electronic navigation aids typically used on vessels

- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH006 Forecast weather and oceanographic conditions

Modification History

Not applicable.

Application

This unit involves the skills and knowledge required to forecast weather and oceanographic conditions during a near coastal voyage and to take appropriate actions based on predictions.

This unit applies to people working in the maritime industry 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

H – Navigation

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 Interpret weather and oceanographic information

- 1.1 Ocean and weather conditions are observed and interpreted
- 1.2 Measurements of current local, meteorological and oceanographic parameters are made and recorded using appropriate shipboard instruments
- 1.3 Weather charts and satellite images are acquired and interpreted

	1.4	Weather reports are obtained and interpreted
2 Use information to predict local weather and oceanographic conditions	2.1	Forecasts of local weather and oceanographic conditions are correctly made using available information
	2.2	Wave height and swell forecast is made using available information
	2.3	Effects of local topographical features on wind flow and weather conditions are estimated using available information
	2.4	Potentially dangerous conditions are identified and appropriate action is taken to secure vessel
3 Maintain records of weather and oceanographic information and forecasts	3.1	Weather and oceanographic information and forecasts are recorded and filed according to organisational procedures
	3.2	Action on vessel operations initiated as a result of weather and oceanographic forecasts is documented according to organisational procedures
	3.3	Meteorological charts, publications and related documentation are updated 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.

Ocean and weather

- air masses and fronts

- conditions must include:
- cloud classifications
 - cyclones, storms and gales
 - ocean currents
 - pressure systems and cold fronts
 - sea state
 - tide prediction

- Shipboard instruments include one or more of the following:
- barograph
 - barometers
 - equipment for receiving weather maps and forecasts
 - wet and dry bulb thermometers

- Appropriate action includes one or more of the following:
- avoiding storm centres and dangerous quadrants by adjusting course and speed
 - ensuring all vessel equipment is properly secured
 - taking action to avoid extreme adverse weather conditions

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH4001A Forecast weather and oceanographic conditions.

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 MARH006 Forecast weather and oceanographic conditions

Modification History

Not applicable.

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:

- ensuring currency of relevant reference material
- observing, interpreting and forecasting weather and oceanographic conditions
- reading, interpreting and applying weather and oceanographic information
- recognising problems that may occur when interpreting weather and oceanographic information
- selecting and using shipboard instruments to assist in forecasting weather and oceanographic conditions
- supporting reasons for intended action with statistical data and observations of actual conditions
- using tide tables to calculate height of tide.

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:

- basic principles for making meteorological and oceanographic measurements
- effects on navigation and vessel handling of wind, currents and bottom topography
- heat exchange process
- principles and procedures of weather forecasting using information obtained from observations, charts, satellite images, reports and instruments
- procedures for filing and maintaining weather and oceanographic information
- procedures to be followed during gale conditions and tropical revolving storms
- sources of weather and oceanographic information, and methods for their interpretation
- topographical effects on wind flow
- typical problems in forecasting weather and oceanographic conditions
- vertical division of the atmosphere
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH007 Apply command navigation procedures on vessels limited by tonnage or near coastal operations

Modification History

Not applicable.

Application

This unit involves the skills and knowledge required to manage safe navigational watchkeeping on a commercial ocean-going vessel in compliance with Australian and international regulations and guidelines, protection of the marine environment and the safety of vessel and persons on board.

This unit applies to people who work in the maritime industry as Master or Chief Mate on a vessel of up to 500 gross tonnage (GT) or as a Watchkeeper on a vessel up to 3000 GT or as Master or Chief Mate on vessels up to 3000 GT operating in near coastal waters.

The unit is consistent with the relevant sections of STCW 95 and Marine Orders under the Australian Navigation Act 2012.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

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 Establish safe watchkeeping procedures on vessels, potentially with limited qualified personnel	1.1 Set of Master standing orders is developed to supplement vessel safety management system (SMS) noting number of watchkeeping personnel 1.2 Accepted principles, vessel safety management procedures and Master standing orders are conformed with in conduct, handover and relief of watch 1.3 Appropriate bridge team is established according to vessel SMS and bridge personnel are confirmed as fit for duty 1.4 Duties are assigned to members of bridge team and their performance of those duties is monitored 1.5 Members of bridge team are correctly briefed on their duties 1.6 Action is taken to ensure vessel is navigated safely using appropriate position fixing techniques to check location the vessel and to maintain movement of vessel within planned limitations 1.7 Action is taken to ensure progress of vessel with respect to passage plan is analysed and vessel navigation is managed appropriately to maintain a required estimated time of arrival at a point in the plan 1.8 Accepted principles and procedures are conformed with in relation to frequency and extent of monitoring of traffic, vessel and environment 1.9 Responsibility for safety of navigation is defined according to vessel SMS 1.10 Safe navigational practice is achieved by implementing accepted bridge resource management principles and procedures 1.11 Action is taken to ensure fatigue management strategies are correctly applied by bridge management team
2 Respond to potential collision and emergency situations	2.1 Leadership of bridge team is taken when called to bridge in response to navigational situation 2.2 Circumstances when assistance is required when Master is performing watchkeeping duties are identified 2.3 Potential collision situations are analyse and appropriate action is taken to avoid collision in ample time and in compliance with international collision regulations, resulting

- in a safe passing distance and following practices of good seamanship
- 2.4 SMS procedures and compliance with standard watchkeeping principles are correctly implemented when taking over bridge watch from officer of the watch
- 2.5 Appropriate action is taken to initiate search and rescue procedures on receipt of a distress signal
- 2.6 Appropriate advice is given to watchkeepers and correct actions are implemented regarding a response to navigational or operational emergency situations
- 3 Maintain watchkeeping records**
- 3.1 Relevant information is documented in required records
- 3.2 Action is taken to ensure deck log book and other required records are maintained in an appropriate manner
- 3.3 Required records are 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.

- Principles include one or more of the following:
- ensuring proper watch is maintained at all times, including correct response to avoiding collision and maintaining safe navigation of vessel passage
 - making appropriate assistance available to be summoned to

	- bridge if required by change in vessel situation - taking all necessary precautions to avoid pollution of marine environment
Responsibility for safety of navigation must include:	- periods under pilotage - periods when Master is on bridge
Fatigue management strategies include one or more of the following:	- arranging assistance for watchkeepers when symptoms of fatigue are identified - ensuring avoidance of excessive consumption of alcohol prior to watchkeeping duties - following appropriate dietary habits - maintaining personal fitness and health - planning appropriate actions when un-fatigued personnel are not available - recognising symptoms of fatigue
Emergency situations include one or more of the following:	- cargo shift - distress signal - dragging anchor - entry into confined spaces - failure of bridge equipment, steering equipment, navigational lights - fire - fog and restricted visibility - fouled hawse - heavy weather - intoxicated persons on board vessel - loss of: - main engines - mooring lines or winches when berthing - watertight integrity - person overboard - personnel working aloft or overside - possible collision - retrieval of survivors from water - stranding - sudden list or loll - synchronous rolling

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH5001A Apply command navigation procedures on vessels limited by tonnage or near coastal operations.

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 MARH007 Apply command navigation procedures on vessels limited by tonnage or near coastal operations

Modification History

Not applicable.

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:
 - circumstances requiring Master to call for assistance from a second qualified watchkeeper
 - necessary action when called to bridge by officer of watch
- briefing officers of watch on passage plan and their watchkeeping duties
- communicating effectively with other personnel when managing safe navigational watchkeeping activities
- complying with mandatory rules, regulations and International Maritime Organization (IMO) Conventions and Codes, including relevant sections of Australian Maritime Safety Authority (AMSA) Marine Orders and ensuring codes, guidelines and standards recommended by IMO, classification societies and maritime industry organisations are taken into account
- conducting emergency procedures
- determining:
 - actions to take with respect to executing passage plan
 - most important watchkeeping task at any given time
- ensuring established passage plan is correctly carried out
- exchanging information with pilot about pilotage plan and conduct of bridge team
- managing watchkeeping arrangements while underway, when berthed or moored, when slipped or in dry dock, during routine or unplanned events.
- performing pilotage duties, where permitted
- providing leadership to bridge team
- recognising and adapting appropriately to cultural differences in the workplace, including modes of behaviour, and interactions and communication with others
- recognising situations warranting alterations to bridge team, including situations where vessel is under pilotage
- solving problems that may arise when managing bridge team
- taking prompt action to report and/or rectify watchkeeping incidents according to established procedures

- using available technology when managing navigational watchkeeping activities.

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:

- applicable legislation, regulations and codes of practice
- bridge watch handover procedures
- causes of groundings, collisions and casualties when on board vessel
- documentation and records, including:
 - operational orders
 - Master standing and night orders
 - established passage plan
 - navigational charts
 - relevant maritime regulations as they relate to watchkeeping functions and operations during a coastal voyage
 - vessel log
 - company safety management system (SMS)
 - instructions of relevant maritime authorities
- range of factors that can affect watchkeeping functions on vessels under 500 GT and their implications, including:
 - maintaining proper lookout by all available means at all times
 - need to adhere to established passage plan
 - never leaving the bridge unattended
 - weather and sea conditions, visibility and whether there is daylight or darkness
 - proximity of navigational hazards
 - use and operational condition of navigational aids
 - operational status of bridge instrumentation, controls and alarms
 - provision on bridge of unmanned machinery space (UMS) controls, alarms and indicators
 - unusual demands on navigational watch arising from operational conditions
 - traffic density and other activities occurring in area in which vessel is navigating
 - size of vessel and field of vision available from conning position
 - attention necessary when navigating in or near traffic separation schemes or other routeing measures
 - rudder and propeller control and vessel manoeuvring characteristics
- fatigue management principles and techniques
- navigational aids including:
 - compass and azimuth mirror
 - electronic navigation systems
 - radar

- electronic charts
- navigational hazards during voyage and implications for watchkeeping
- precautions necessary when navigating in or near traffic separation schemes or other routing measures
- principles for maintaining a safe navigational watch on vessels with potentially limited qualified personnel
- principles of bridge team management
- International Regulations for Preventing Collisions at Sea
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH008 Plan and conduct a passage

Modification History

Not applicable.

Application

This unit involves the skills and knowledge required to plan and conduct a passage and to determine position on a vessel using a range of bridge equipment, and to evaluate meteorological information to inform passage planning.

This unit applies to a Watchkeeper Deck, a Master up to 500 gross tonnage or a Master up to 80 metres Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

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 passage

- 1.1 Navigational charts, nautical publications and related documentation are selected for the area of navigation and corrected according to the latest information available
- 1.2 Information from charts and publications is interpreted and applied to accurately identify potential navigational hazards relevant to the proposed voyage

- 1.3 State of the tide at specified locations is determined and findings are applied to the passage plan
- 1.4 Route for voyage is determined and critical points along the proposed route of voyage are identified and plotted
- 1.5 Accurate calculations and measurements of navigational information are made
- 1.6 Meteorological information is obtained and interpreted, and weather and sea condition hazards relevant to the proposed voyage are identified prior to departure
- 1.7 Route is modified as required to take into account weather and sea condition hazards
- 1.8 Planned route for voyage is recorded according to organisational and regulatory requirements
- 2 Conduct passage**
 - 2.1 Mode of steering is selected appropriate for the prevailing weather, sea and traffic conditions and intended manoeuvres
 - 2.2 Measurements and observations of sea and weather conditions are used to determine vessel speed and direction
 - 2.3 Information from bridge equipment is interpreted to identify navigational hazards and fix vessel position
 - 2.4 Alterations to vessel course or speed are made to meet prevailing circumstances and changing conditions
 - 2.5 Navigational manoeuvres are conducted within safe operational limits of vessel
 - 2.6 Details of passage are recorded in vessel log according to regulations
 - 2.7 Variations to planned route are documented prior to archiving on completion of the voyage
- 3 Fix vessel position**
 - 3.1 Primary position fixing method is selected according to prevailing circumstances and conditions
 - 3.2 Position is fixed using selected method and information derived from relevant wheelhouse equipment
 - 3.3 Position is determined within limits of acceptable instrument/system errors

	3.4	Position is recorded on a navigational chart according to regulatory requirements
	3.5	Fixes are taken at time intervals appropriate for prevailing navigational conditions
	3.6	Reliability of information obtained from primary method of position fixing is checked at appropriate intervals
	3.7	Performance checks of position fixing instruments and wheelhouse equipment are carried out according to organisational procedures and manufacturer instructions
4 Determine appropriate action to take with respect to plotted position	4.1	Assessment of the set, drift and leeway being experienced by the vessel is made
	4.2	Course is adjusted to maintain or resume planned route where the position indicates a deviation has occurred
	4.3	Dead reckoning (DR) and/or estimated position (EP) is projected along planned route according to the course made good between previously observed positions
5 Analyse navigational system performance	5.1	Theoretical performance of navigational system is determined
	5.2	Measurement equipment is selected, and checks and tests are conducted
	5.3	Data is analysed and theoretical performance is checked with actual performance
	5.4	Significance of variation between theoretical and actual performance is determined
	5.5	Appropriate action is taken to bring performance to acceptable instrument/system errors

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.

Navigational charts, nautical publications and related documentation include one or more of the following:	• electronic chart display systems • Nautical Almanac • nautical tables • Notices to Mariners • paper charts • radio navigational warnings • sailing directions • temporary warning notices • tide tables • vessel routeing information • weather reports and warnings

Navigational hazards include one or more of the following:	• restricted visibility • shallow ground • traffic • unlit beacons

Mode of steering includes one or more of the following:	• automatic pilot • electric systems • hydraulic systems

Conditions include one or more of the following:	• buoyage • overall passage plan requirements • prevailing weather and sea conditions • proximity and course of other vessels • relevant navigational hazards • signage

Primary position fixing	• celestial observations

method includes one or more of the following:

- radar ranges or bearings
- radio navigation aids
- running fix
- simultaneous bearings or transits of coastal features
- soundings to determine position
- terrestrial observations

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH5002A Plan and conduct a passage.

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 MARH008 Plan and conduct a passage

Modification History

Not applicable.

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:

- accurately measuring and observing weather conditions
- accurately preparing calculations and measurements of navigational information
- adjusting steering controls for optimum performance
- calculating courses using plane, mercator and great circle sailing methods
- changing over from manual to automatic control and vice versa
- checking reliability of information obtained from primary method of position fixing at appropriate intervals
- correctly interpreting and applying meteorological information
- determining errors in magnetic and gyro compasses, and correctly applying to courses and bearings
- determining errors of magnetic and gyro compasses using celestial and terrestrial means, and allowing for such errors
- determining vessel position by use of:
 - landmarks
 - aids to navigation including lighthouses, beacons and buoys
 - rising and dipping distances of lights and the use of horizontal angles
 - dead reckoning, taking into account winds, tides, currents and estimated speed
 - electronic navigational aids
- determining vessel position within the limits of acceptable instrument/system errors
- estimating position using dead reckoning
- interpreting nautical charts and publications
- maintaining charts and publications by applying up-to-date corrections to both paper and electronic charts and publications
- operating echo-sounders and applying the information correctly
- producing accurate and reliable information
- reading the aneroid barometer and interpreting the information obtained
- selecting mode of steering most suitable for prevailing weather, sea and traffic conditions and intended manoeuvres
- selecting most appropriate primary method of fixing vessel position for the prevailing circumstances and conditions

- using and interpreting information obtained from shipborne meteorological instruments
- using celestial bodies to determine vessel position
- using chart catalogues, charts, nautical publications, radio navigation warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass
- using nautical charts and publications
- using meteorological information available.

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:

- basic meteorological terms
- characteristics of the various weather systems, reporting procedures and recording systems
- charted information including that in the Title Block, Zones of Confidence Diagrams and Datums
- compass error from transit bearings or by bearings taken from a known position
- determining the times and heights of high and low water from Australian or local tide tables for any port and the relevance of chart datum
- effects of current and of leeway on the course and speed of the vessel (without calculations)
- finding the variation from the chart
- fixing vessel position by:
 - simultaneous bearings, transits of coastal features, and by running fix
 - radar ranges and bearings
- information given on a chart or plan
- interpreting the set and drift of the current from information available on the chart
- measuring distance on a chart
- meteorological instruments and their use
- nautical charts and publications
- plane, Mercator and great circle sailing concepts
- principles of magnetic and gyro compasses
- recognising the presence of either or both factors
- relating coastal features to a chart
- relationship between compass, magnetic, true and gyro courses and bearings
- relative bearings
- selection of suitable points for bearings
- sources of weather forecasts and the interpretation of that information
- steering control systems
- steering control systems operating procedures
- tropical revolving storms and weather associated with such storms
- use and limitations on the use of electronic position fixing equipment found on small vessels
- use of a deviation card without mathematical interpolation

- using a single position line to assist in clearing dangers
- using modern electronic navigational aids to determine vessel position
- using soundings in determining position
- using terrestrial observations to determine vessel position individually or in combination with other methods
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH009 Use an electronic chart display and information system to navigate safely

Modification History

Not applicable.

Application

This unit involves the skills and knowledge required to maintain safe navigation of a commercial vessel greater than 500 gross tonnage (GT) using an electronic chart display and information system (ECDIS).

This unit applies to a Watchkeeper Deck, a Master up to 500 GT, a Master up to 80 metres Near Coastal or a Master Unlimited.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

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 Set up an ECDIS

- 1.1 ECDIS is initialised and programmed with own vessel data
- 1.2 Operational performance and accuracy of ECDIS is confirmed
- 1.3 Settings and values are adjusted to suit conditions for passage planning and navigation

	1.4	Means of providing additional information is correctly interfaced with ECDIS
2 Use an ECDIS for passage planning and navigation	2.1	ECDIS is used to assist in passage planning and the conduct of navigation
	2.2	Information on ECDIS is monitored to ensure safe navigation
	2.3	Information obtained from ECDIS is interpreted and analysed taking into account limitations of equipment, all connected sensors and prevailing circumstances and conditions
	2.4	Position of vessel is confirmed by alternative means
	2.5	Safety of navigation is maintained through adjustments made to vessel course and speed
	2.6	System and position alarms are responded to, to maintain safety of navigation
	2.7	Situational awareness is maintained while using ECDIS
3 Maintain data	3.1	Data produced by ECDIS that should be retained to conform with organisational procedures and regulatory requirements is identified
	3.2	Data is stored electronically or in hard copy as required by organisational procedures and regulatory requirements
	3.3	Security and access requirements for data are adhered to in accordance with 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.

ECDIS must include:	• adequate and up-to-date back-up paper charts • adequate and up-to-date electronic charts • back-up systems • electronic position fixing system • gyro and log • raster charts • uninterruptable power supply • vector electronic chart systems
Settings include one or more of the following:	• alarm parameters for anti-grounding • back-up arrangements • chart update status • completeness of chart data • proximity to contacts and special areas
Additional information must include:	• automatic identification system (AIS) input • radar/automatic radar plotting aid (ARPA) input
Information includes one or more of the following:	• chart data displayed • contacts • mode and orientation • own position • radar overlay functions • radar tracking • route monitoring • sea area display • user-created information layers
System and position alarms must include:	• approach to waypoint, critical point , navigation danger and other ships • chart alarms • depth and contour alarms • mode losses

- primary failure

Situational awareness includes one or more of the following:

- chart data and scale selection
- contact detection and management
- integrity of sensors
- safe water and proximity of hazards
- set and drift
- suitability of route

Data includes one or more of the following:

- chart correction information
- electronic navigational chart (ENC) source, date and edition
- vessel voyage details

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH5003A Use an electronic chart display and information system to navigate safely.

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 MARH009 Use an electronic chart display and information system to navigate safely

Modification History

Not applicable.

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:

- adjusting settings and values to suit present conditions
- conducting tests for malfunctions including functional self testing and interpreting the test results
- confirming vessel position by alternative means
- ensuring integrity of back-up systems
- ensuring integrity of data
- maintaining situational awareness while using electronic chart display and information system (ECDIS)
- operating ECDIS when interfaced with automatic identification system (AIS) and interpreting AIS data
- operating, interpreting and analysing information:
 - when radar and automatic radar plotting aid (ARPA) is connected to ECDIS
 - obtained from ECDIS
- operating, interpreting and analysing information
- planning a passage on a display using ECDIS
- safely monitoring and adjusting information
- setting up initial display and maintaining display
- using functions that are integrated with other navigation systems in various installations
- using settings efficiently to ensure conformance to operational procedures.

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:

- correcting and updating charts by manual, semi automatic and automatic systems
- dangers of over-reliance
- differences between vector and raster charts
- differences between ECDIS, ECS and raster chart display system (RCDS)
- functions of ECDIS required by performance standards in force
- principles, capability and limitations of ECDIS operations

- requirements for voyage recording
- significance of chart alarms and indicator warnings
- use of ECDIS in emergency situations
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARH010 Use bridge equipment to determine vessel position

Modification History

Not applicable.

Application

This unit involves the skills and knowledge required to maintain safe navigation of a vessel through the use of radar and other bridge equipment to determine vessel position.

This unit applies to a Watchkeeper Deck, a Master up to 500 gross tonnage (GT), a Master up to 80 metres Near Coastal or a Master Unlimited.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

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 Set up bridge equipment

- 1.1 Bridge equipment is initialised and displays are set up and maintained
- 1.2 Operational performance and accuracy of bridge equipment is confirmed and appropriate action is taken when performance is out of limits
- 1.3 Any false echoes and misrepresentations are detected, identified and rejected

2 Use radar to safely navigate	2.1 Radar is operated according to manufacturer instructions to produce data on position of vessel, other vessels and fixed objects 2.2 Radar plot is constructed on radar plotting sheet and automatic plotting devices are initialised 2.3 Systematic radar observations of vessels in the vicinity are made and risk of collision is determined 2.4 Radar data is used to obtain a position fix for vessel using electronic bearing lines and variable range markers 2.5 Radar bearings are corrected for vessel heading and compass error as appropriate 2.6 Adjustments are made to vessel course and speed to maintain safety of navigation 2.7 Manoeuvring signals are made at appropriate time according to regulations
3 Use bridge equipment to safely navigate	3.1 Bridge equipment is safely and efficiently used to conduct navigation of vessel 3.2 Position of vessel is monitored during voyage to ensure planned passage is followed 3.3 Movements of vessels in the vicinity are monitored to ensure collision situations do not occur 3.4 Adjustments are made to vessel course and speed to maintain safety of navigation 3.5 Manoeuvring signals are made at appropriate time according to regulations 3.6 Bridge equipment is maintained according to manufacturer requirements and organisational procedures
4 Maintain navigational records	4.1 Navigational data produced by bridge equipment that should be retained to conform with organisational procedures and regulatory requirements is identified 4.2 Navigational data is stored electronically or in hard copy as required by organisational procedures and regulatory requirements 4.3 Security and access requirements for data are adhered to

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.

- Bridge equipment includes one or more of the following:
- automatic identification systems
 - automatic pilot
 - automatic radar plotting aid (ARPAs)
 - azimuth mirrors and other bearing measurement devices
 - bridge alarm systems
 - chronometer
 - electronic chart display and information system (ECDIS)
 - echo sounder
 - differential satellite navigation systems
 - doppler and electro-magnetic speed logs
 - integrated navigation systems
 - Loran C navigation systems
 - magnetic and gyro compasses including rate of turn gyro
 - navigation light systems
 - radar
 - satellite navigation systems
 - sextant
 - signalling devices
 - voyage data recorders

Misrepresentations
includes one or more of
the following:

- compass errors
- false echoes
- incorrect radar settings for heading marker and range marker
- incorrect setting up of electronic chart system (ECS) or ECDIS
- incorrect setting up of satellite navigation systems
- satellite and differential satellite navigation system errors
- sea and rain clutter returns

Navigational data includes
one or more of the
following:

- navigation safety warning
- recording of courses steered
- weather and oceanographic reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARH5004A Use bridge equipment to determine vessel position.

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 MARH010 Use bridge equipment to determine vessel position

Modification History

Not applicable.

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:

- clearly and concisely communicating at all times in a seamanlike manner
- correctly interpreting and analysing information obtained from radar and automatic radar plotting aids (ARPAs) taking into account the limitations of equipment and prevailing circumstances and conditions
- correctly interpreting information received from other bridge equipment and applying appropriate corrections
- determining latitude by meridian altitude
- making adjustments to vessel course and speed to maintain safety of navigation
- making decisions to amend course or speed in a timely manner according to accepted navigation practice
- making manoeuvring signals at the appropriate time according to International Regulations for Preventing Collisions at Sea
- planning and conducting celestial observations using a sextant and plotting a position
- taking action to avoid close encounter or collision according to International Regulations for Preventing Collisions at Sea.

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:

- ARPA system performance and accuracy, tracking capabilities, limitations and processing delays
- course and speed of other vessels
- critical echoes, exclusion areas and trial manoeuvres
- detecting course and speed changes of other vessels
- detection of misrepresentation of information, false echoes, sea and rain clutter etc., racons and search and rescue transponders (SARTs)
- effect of changes in own vessel course and speed or both
- factors affecting performance and accuracy of radar and other navigational equipment
- fundamentals of radar and ARPAs

- ground and sea stabilisation and their effects on ARPA data
- identification of critical echoes
- International Regulations for Preventing Collisions at Sea
- meeting overtaking vessels
- methods of position fixing using celestial observations with a sextant
- methods of target acquisition and their limitations
- parallel indexing
- plotting techniques and relative- and true-motion concepts
- principal types of ARPAs, their display characteristics, performance standards and the consequences of over reliance on ARPAs
- range and bearing by radar
- sea and ground stabilisation and their effect on ARPA data
- setting up and maintaining displays on radar
- time, distance and bearing of closest point of approach of a closing vessel
- true and relative vectors, graphic representation of target information and danger areas
- use of operational warnings and system tests
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARI001 Comply with regulations to ensure safe operation of a vessel up to 12 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply current commonwealth, state and territory Acts, legislation, codes of practice and other publications pertaining to the safe operation of a vessel up to 12 metres.

This unit applies to Coxswain Grade 1 Near Coastal and Coxswain Grade 2 Near Coastal working in the maritime industry on vessels up to 12 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

I – Regulations and Port Operations

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 Determine relevant rules and regulations impacting on work practices

- 1.1 International Regulations for Preventing Collisions at Sea are comprehended and implemented
- 1.2 Responsibilities as the person in charge of a vessel are identified
- 1.3 Relevant commonwealth, state, territory and local

		legislation governing the vessel and the passage are comprehended
2	Comply with industry and professional codes of practice	2.1 Relevant industry and professional codes of practice are sourced 2.2 Commitment to comply with industry and professional codes of practice is demonstrated through own behaviour
3	Apply legislative and regulatory requirements to the operation of the vessel	3.1 Regulatory requirements relating to operational aspects of the vessel are recognised and appropriate procedures are developed 3.2 Situations where rules must be applied in order to avoid collisions are recognised 3.3 Safety requirements are implemented according to legislative and regulatory requirements 3.4 Compliance with all relevant rules and legislation is demonstrated while operating the vessel
4	Identify changes in laws and regulations and their implications for vessel operation	4.1 Changed legislation and regulations are accessed 4.2 Changes in regulatory requirements are identified and applied 4.3 Operational procedures are reviewed to reflect changes in legislation and regulations
5	Maintain statutory records	5.1 Copies of relevant records are maintained 5.2 Evidence of current authorisation, training and relevant licences is maintained according to legislative and regulatory requirements

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.

Regulatory requirements relating to operational aspects of the vessel include one or more of the following:	• assisting in distress • certificates on board a vessel • distress signals • duties and responsibilities of the Master • International Association of Lighthouse Authorities (IALA) Buoyage System • International Regulations for Preventing Collisions at Sea • lifesaving and firefighting appliances • lights, shapes and sounds • logbook or vessel record book • marine pollution prevention • Marine Safety (Domestic Commercial Vessel) National Law, Regulations, Marine Orders and National Standard for Commercial Vessels (NSCV) • operational areas and classifications of vessels • safety management systems or plans • WHS/OHS legislation
Records include one or more of the following:	• applicable logbooks • environmental control documents • survey certificates

Unit Mapping Information

This is a new unit. This unit is equivalent to MARI2001A Comply with regulations to ensure safe operation of a vessel up to 12 metres.

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 MARI001 Comply with regulations to ensure safe operation of a vessel up to 12 metres

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 on at least one occasion and include:

- applying regulations pertaining to the safe operation of a vessel
- applying safety management plan standards and emergency operating procedures
- conducting inductions for crew where applicable
- demonstrating an understanding of the duties and responsibilities relating to a Coxswain
- obtaining and complying with information from commonwealth, state and territory Acts, legislation, codes of practices and other publications relating to the safe navigation of a vessel
- providing appropriate level of detail in recordkeeping.

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:

- assisting in distress
- certificates on board a vessel
- contents of marine notices, annual notices to mariners
- distress signals
- duties and responsibilities of the person in charge
- International Association of Lighthouse Authorities (IALA) Buoyage System A
- International Regulations for Preventing Collisions at Sea
- large commercial traffic
- lifesaving and firefighting appliances
- lights, shapes and sounds
- logbook or vessel record book
- marine pollution prevention
- National Standard for Commercial Vessels (NSCV) Part C Section 7
- operational areas and classifications of vessels
- state and territory marine legislation
- work health and safety (WHS)/occupational health and safety (OHS) legislation.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARI002 Observe regulations to ensure safe operation of a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply current commonwealth, state and territory Acts, legislation, codes of practice and other publications pertaining to the safe operation of a vessel up to 80 metres.

This unit applies to people working in the maritime industry on vessels up to 80 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

I – Regulations and Port Operations

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 Interpret relevant maritime rules and regulations impacting on vessel operations and personal responsibilities	1.1	Regulatory requirements for vessel operations and maintenance are followed
	1.2	Duties and responsibilities as the person in charge of a vessel are recognised
	1.3	Relevant commonwealth, state and territory or local legislation governing the vessel and the passage are

		identified
	1.4	Organisational procedures relating to the vessel's safety management system are identified
	1.5	Copies of relevant rules and regulations are stored in an accessible location on the vessel according to regulations
2 Ensure continuous validity of vessel certification	2.1	Certification expiry dates for the vessel, renewal requirements, periodic inspections or extensions are checked to ensure continuous validity
	2.2	Survey items and equipment are tested, checked and maintained according to certificate conditions
	2.3	Arrangements for renewals and surveys are completed in a timely manner and comply with issuing authority requirements
	2.4	Vessel's documents are completed and any effects of damage and alterations or additions to the vessel or operations are specified according to certification requirements and authority procedures
	2.5	Certificates and documentation are stored in a location on the vessel according to regulations
3 Apply legislative and regulatory requirements to vessel operations and maintenance	3.1	Regulatory requirements relating to operations and maintenance of the vessel are interpreted and applied as required
	3.2	Vessel procedures for monitoring operations and maintenance are implemented
	3.3	Training and instruction, including induction training, on procedures is instigated to ensure crew comply with regulations
	3.4	Failure to comply with procedures is identified and dealt with according to organisational procedures
	3.5	Tasks are monitored to ensure compliance with regulatory requirements
	3.6	Problems that may lead to potential non-compliance are promptly identified and rectified or reported according to organisational procedures
	3.7	Compliance with all relevant legislative and regulatory requirements is demonstrated while operating the vessel

4 Maintain statutory records of compliance	4.1	Regulatory requirements related to records and reports are interpreted
	4.2	Records and reports are completed to comply with applicable regulations
	4.3	Records and reports are distributed to the required maritime authority at appropriate times and places
	4.4	Copies of records and reports are maintained according to regulatory requirements
	4.5	Evidence of current authorisation, training and relevant licences are maintained according to legal and regulatory requirements

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.

Regulatory requirements for vessel operations and maintenance include:	• assisting in distress • certificates on board a vessel • distress signals • duties and responsibilities of the Master • International Association of Lighthouse Authorities (IALA) Buoyage System • International Regulations for Preventing Collisions at Sea • lifesaving and firefighting appliances

- lights, shapes and sounds
- logbook or vessel record book
- marine pollution prevention
- operational areas and classifications of vessels
- radio logbook and regulations
- WHS/OHS legislation

Records and reports
include one or more of the
following:

- applicable logbooks
- environmental control logbooks
- survey certificates

Unit Mapping Information

This is a new unit. This unit is equivalent to MARI3001A Observe regulations to ensure safe operation of a vessel up to 80 metres.

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 MARI002 Observe regulations to ensure safe operation of a vessel up to 80 metres

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 on at least one occasion and include:

- identifying and acting according to the duties and responsibilities of the Master
- identifying and solving problems to do with the implementation of regulations relating to the operations, security and maintenance of a vessel up to 80 metres
- interpreting and applying regulations related to the operations, security and maintenance of a vessel up to 80 metres
- maintaining statutory records of compliance including logbooks
- obtaining information from commonwealth, state and territory Acts, legislation, codes of practice and other publications relating to the operations, security and maintenance of a vessel up to 80 metres
- recognising navigation marks in the International Association of Lighthouse Authorities (IALA) Buoyage System
- providing the required amount of detail in reports
- providing training, inductions and briefings to crew and passengers.

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:

- action that must be taken for non-compliance with applicable maritime regulations
- applicable International Maritime Organization (IMO) conventions
- applicable state and territory maritime regulations relating to the operation of vessels up to 80 metres
- certificates to be carried on board
- collision regulations relevant to a domestic Australian vessel up to 80 metres
- content of publications and Marine Notices about:
 - navigational warnings (including firing practices)
 - precautions concerning submarine cables and pipelines
 - search and rescue
- commonwealth legislation concerning safety of life at sea

- commonwealth and state legislation reflecting the provisions of International Conventions for the Prevention of Pollution from Ships (MARPOL)
- importance of maintaining a logbook or vessel record book
- information relating to safe navigation in coastal waters
- IALA Buoyage System A
- laws relating to lifesaving appliances; fire appliances; distress, urgency and safety signals
- legal certification requirements for a vessel less than 80 metres
- procedures for monitoring compliance with relevant maritime regulations
- responsibilities for the prevention of pollution of the marine environment
- relevant aspects of a safety management system (International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM) Code)
- relevant state/territory Acts, regulations, notices, determinations or other legislation about the operation of trading vessels for which the certificate will be valid
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation
- requirements for records and reports that must be made under applicable maritime regulations
- risk management principles and application
- Uniform Shipping Laws (USL) Code, in particular Section 15, Emergency Procedures and Safety of Navigation and National Standard for Commercial Vessels (NSCV) Part C, Section 7.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARJ001 Follow environmental work practices

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to be aware of environmental issues and to apply organisational policies and procedures to minimise environmental threats.

This unit applies to people working in the maritime industry on vessels up to 80 metres as a:

- Coxswain Grade 1 Near Coastal
- Coxswain Grade 2 Near Coastal
- Marine Engine Driver Grade 1 Near Coastal
- Marine Engine Driver Grade 2 Near Coastal
- Marine Engine Driver Grade 3 Near Coastal
- Integrated Rating
- Chief Integrated Rating.

These people could be working independently or as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

J – Environment

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 Implement environmental work

- 1.1 Workplace practices and work instructions relating to potential environmental impacts are implemented

practices	1.2	Relevant legislation, codes of practice and standards that impact on environmental work practices are recognised and followed
	1.3	Environmental protection measures are implemented
	1.4	Containment procedures are applied according to workplace procedures where appropriate
	1.5	Approved waste management procedures and practices are implemented
	1.6	Signs or symptoms of a potential environmental threat are recognised and reported to appropriate personnel/authorities
2 Contribute to improved environmental work practices	2.1	Information is gathered and suggestions are made to appropriate personnel for improvements to work practices
	2.2	Environmental issues and their relationship to work practices are discussed with colleagues and appropriate personnel
	2.3	Contributions to the review of environmental work practices and policies are made within limits of own responsibility
3 Maintain environmental records	3.1	Environmental records are accurately prepared according to workplace procedures
	3.2	Environmental records are stored securely

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.

Workplace practices and work instructions must include:	• avoiding or minimising environmental risks • documented policies and procedures • emergency procedures • environmental data recording and reporting procedures • environmental hazard and risk identification • environmental management system • environmental monitoring • hazard and incident reporting and recording procedures • improving environmental performance • signs and labels • waste minimisation and segregation • work plans
Relevant legislation, codes of practice and standards include one or more of the following:	• commonwealth, state and territory legislation • International Convention for the Prevention of Pollution from Ships (MARPOL) • local government by-laws and regulations • third party standards such as the ISO1400 series and those of the Marine Stewardship Council
Protection measures include one or more of the following:	• controlling emissions of gas and smoke • managing waste • observing restricted fishing areas • preventing cargo spillage • preventing fuel and oil spillage • proper use of refrigerant gases • using appropriate signage
Potential environmental threats include one or more of the following:	• anchoring • antifouling paint • garbage • harm to marine life • noise • poorly maintained equipment and machinery • sewage • wash from propellers

- waste and debris for example from oil and fuel containers

Suggestions include one or more of the following:

- improving energy efficiency
- increasing the use of renewable, recyclable, re-usable and recoverable resources
- maximising opportunities such as the use of solar or alternative forms of energy
- preventing and minimising risks
- reducing emissions of greenhouse gas
- using alternative technology to limit growth

Unit Mapping Information

This is a new unit. This unit is equivalent to MARJ2001A Follow environmental work practices.

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 MARJ001 Follow environmental work practices

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 on at least one occasion and include:

- making suggestions for improved environmental work practices
- preparing and keeping clear and concise environmental records
- recognising procedures and following instructions for environmental work practices
- reporting environmental hazards and risks in a timely way.

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:

- environmental and resource hazards and risks associated with the maritime industry
- environmental laws, regulations and standards relevant to work in the maritime industry
- procedures and processes that support environmentally sustainable principles
- procedures for reporting environmental hazards and risks
- relevant environmental sustainability principles
- use of oil spill equipment and its limitations.

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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARJ002 Monitor environmental management on a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to monitor the implementation of environmental management policies and procedures on a vessel up to 80 metres to ensure compliance with marine regulations and environmental considerations.

This unit applies to people working in the maritime industry on a range of vessels up to 80 metres as a:

- Master Inland Waters
- Master up to 24 metres Near Coastal
- Master up to 35 metres Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

J - Environment

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 Ensure crew are able to implement environmental work practices	1.1	Information on environmental management policies and procedures is accessible and communicated to crew
	1.2	Information about identified environmental hazards and outcomes of risk assessments and risk control procedures are accessed and communicated to crew

	1.3	Crew are informed of environmental hazards and risk control measures relating to their work responsibilities
	1.4	Mentoring and coaching are provided to support individuals/crew to implement procedures to support environmental management
	1.5	Crew is supported to implement relevant principles to meet environmental obligations and regulatory requirements
	1.6	Crew is consulted and environmental issues relevant to their work role are identified and promptly resolved or referred to appropriate personnel
2	Monitor observance of environmental management procedures	
	2.1	Procedures for environmental management on the vessel are clearly defined and followed
	2.2	Deviations from environmental management procedures are identified and addressed
	2.3	Personal behaviour is monitored to ensure it is consistent with environmental management procedures
	2.4	Housekeeping standards on the vessel are maintained
	2.5	Breaches of environmental protection requirements are documented according to organisational procedures and regulatory requirements
3	Implement emergency procedures to respond to hazardous events	
	3.1	Procedures for dealing with hazardous events are promptly implemented as required
	3.2	Hazardous events are investigated to identify cause
	3.3	Control measures to prevent recurrence and to minimise risks of hazardous events to the marine environment are implemented
	3.4	Emergency is reported in accordance with organisational procedures and regulatory requirements
4	Maintain and improve vessel environmental management	
	4.1	Risk assessments are conducted and appropriate control measures are identified and implemented according to organisational procedures
	4.2	Appropriate records and log book entries are made to assist the review of managing environmental protection measures
	4.3	Potential hazards are identified, assessed and removed or

reported according to organisational procedures

- 4.4 Recommendations arising from risk assessments are implemented within level of responsibility
- 4.5 Inadequacies in control measures are identified and reported according to organisational procedures
- 4.6 Opportunities for improving environmental performance are identified and raised with appropriate personnel

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.

Environmental management policies and procedures must include:

- ballast water control
- bilge pumping
- disposal of garbage
- disposal of waste oil
- loss of cargo
- loss of vessel
- refuelling
- sewage control
- stowage and management of explosive and flammable material
- transfer of fuel

Environmental hazards

- anchoring

include one or more of the following:

- harm to marine life
- noise
- oil pollution
- polluting emissions of gas and smoke
- spillages of cargo
- spillages of fuel
- waste pollution

Relevant principles include one or more of the following:

- ballast water management
- preventing oil pollution
- sewage discharge
- stowage and management of explosive and flammable materials
- waste collection, treatment, recycling or disposal

Housekeeping standards include one or more of the following:

- pollution control and equipment
- waste minimisation and control

Hazardous events include one or more of the following:

- anchoring in a prohibited sensitive area
- garbage discharge
- polluting emissions of gas and smoke
- poorly maintained equipment and machinery resulting in pollution
- sewage discharge
- spillages of cargo
- waste and debris spillage from oil and fuel containers

Control measures include one or more of the following:

- cofferdams around fuel vents and manifolds
- oil spill absorbent material
- oil spill containment equipment
- oily water separators, if fitted
- sound operational procedures

Unit Mapping Information

This is a new unit. This unit is equivalent to MARJ3001A Monitor environmental management on a 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 MARJ002 Monitor environmental management on a 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 on at least one occasion and include:

- communicating information about environmental management and related procedures to crew
- ensuring that appropriate and timely action is taken in response to emergencies
- ensuring that environmental records and documentation are accurate, complete and timely, according to organisational and regulatory requirements
- ensuring that housekeeping standards are maintained
- identifying typical pollution control problems and taking appropriate action
- implementing preventative and remedial anti pollution procedures according to organisational and regulatory requirements
- maintaining compliance with legislation for protection of the marine environment
- modelling work policies and procedures to support environmental management
- monitoring responsible resource utilisation on the vessel, consistent with organisational policies
- participating in consultation processes to improve environmental management in the organisation
- participating in investigations of non-compliance and risk assessment processes
- providing access to and maintaining current environmental management information for the crew
- responding to environmental hazard identification and hazardous incidents in an appropriate and timely manner
- reviewing practice and procedures to implement recommendations arising from risk assessments
- supporting others to follow environmental management procedures.

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:

- documentation system and procedures
- effects on marine environment of various possible pollution incidents

- environmental hazards and control methods associated with work activities on a vessel
- legal responsibilities as determined by relevant legislation, codes of practice, policies and procedures to protect the marine environment
- operational characteristics of emission control equipment used on various types and sizes of vessels
- operational requirements of water, bilge, waste, pollution and recycling management processes used on various types and sizes of vessels
- own responsibilities for preventing pollution of the marine environment
- pollution control problems and related measures to protect the marine environment
- principles of environmental management
- principles of risk management
- requirements for fishing, anchoring and other activities in environmentally sensitive areas
- requirements under Australian and/or international legislation and conventions for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment
- responsibilities of self and employer to manage environmental issues
- 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARJ003 Ensure compliance with environmental management legislation

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to coordinate environmental activities on a vessel to ensure compliance with relevant legislation, regulations, permits and/or licences.

This unit applies to people working in the maritime industry as an Engineer Watchkeeper, or a Marine Engineer Class 3 Near Coastal, or a Master up to 500 gross tonnage (GT), or a Master up to 80 metres Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

J - Environment

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 Confirm environmental management responsibilities

1.1	Legislative and regulatory requirements, and approvals that apply to the vessel are interpreted
1.2	Own scope of authority/responsibility for achieving specific environmental outcomes for the vessel and the roles of other key personnel are clarified

	1.3	Resources available to implement environmental management policies for the vessel are identified
2 Develop a positive environmental reputation	2.1	Stakeholders, their relationship to the vessel and perceived attitudes about the vessel are identified
	2.2	Appropriate strategies are used to foster the trust and confidence of stakeholders
	2.3	Requests for information are responded to in the appropriate format and a timely manner
	2.4	Difficult situations are identified and solutions are negotiated using a collaborative approach
	2.5	Regular feedback is obtained and used to enhance positive relations
3 Provide environmental management information and training	3.1	Environmental management plans and recent incident reports are used to identify training needs of crew members
	3.2	Information and training is developed and provided to ensure all crew members understand their environmental obligations/responsibilities
	3.3	Crew member understanding of environmental obligations/responsibilities for work areas and activities is confirmed
	3.4	Effectiveness of the information and training is monitored and additional information/training is provided as required
4 Assess environmental impacts and risks	4.1	Activities are reviewed to identify implications for environmental management
	4.2	Potential risks and incidents that may cause harm to the environment are identified
	4.3	Inspections and in situ measurements are conducted to quantify risks and impacts
	4.4	Assessment of risks and impacts are reported according to organisational procedures
5 Ensure environmental monitoring and management plans	5.1	Environmental monitoring instruments are checked to ensure they are fully functioning
	5.2	Specified environmental monitoring and inspections are conducted to check performance against environmental

are implemented		management requirements
6 Respond to environmental non-conformance and incidents	5.3	Additional monitoring/inspections are conducted after atypical events or requests from authorities to assess whether environmental management plan is operating
	5.4	Results for monitoring/inspections are analysed to identify significant trends, non-conformance and/or incidents
	6.1	Unusual situations, unexpected risks/hazards and potential/actual environmental incidents are recognised
	6.2	Organisational procedures for responding to environmental noncompliance and incidents are implemented to ensure prompt control and remediation
	6.3	Causes of noncompliance and incidents are investigated according to organisational procedures
	6.4	Findings are analysed to identify opportunities to improve work practices, environmental controls, crew training and/or management procedures
	6.5	Corrective/preventative actions are implemented to prevent recurrence of noncompliance and incidents, and to reduce risks
	6.6	Reports are completed according to organisational procedures
	7.1	Regular reports about environmental performance are provided
	7.2	Opportunities and recommendations for improvements are reported
7 Keep the Master informed about environmental performance	7.3	Master's advice is sought when challenges are beyond own scope of technical competence or when input from environmental specialist may be required
	8.1	Required records are prepared and maintained according to regulatory and organisational requirements
	8.2	Records are stored to enable easy access and review by authorised personnel according to regulatory and organisational requirements
8 Maintain environmental records		

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.

Legislative and regulatory requirements, and approvals include one or more of the following:	• Australian and international standards • commonwealth legislation and regulations • Marine Orders • International Convention for the Prevention of Pollution from Ships (MARPOL) and International Maritime Organization (IMO) circulars • state/territory legislation and regulations
Stakeholders include one or more of the following:	• cargo owners • government officials • port authorities
Information and training include one or more of the following:	• due diligence and duty to notify • environmental management actions and checklists, methods/procedures for specific activities • incident management and reporting • introduction to vessel, environmental considerations and sources of environmental information • legislative requirements • licensing/compliance requirements • organisational environmental management policy
Potential risks and	• ballast water discharge

incidents include one or more of the following:

- disposal of waste material including sewage and garbage
- over-side maintenance work
- spill or release of hazardous chemicals/materials

Environmental monitoring instruments include one or more of the following:

- emission control equipment
- fuel management systems
- oily water separators
- waste storage monitoring equipment

Reports include one or more of the following:

- hazard near miss report form
- monthly environmental report
- non-conformance report form
- regulatory agency reports
- vessel incident investigation report
- waste disposal log books
- weekly environmental report

Records include one or more of the following:

- contractor and supplier information
- correspondence
- digital photographs
- environmental monitoring data
- records of training
- records of monitoring equipment purchase, calibration, inspection, maintenance and service
- records of environmental non-conformance, incidents or significant impacts
- records required by permit, approval or licence conditions

Unit Mapping Information

This is a new unit. This unit is equivalent to MARJ5001A Ensure compliance with environmental management legislation.

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 MARJ003 Ensure compliance with environmental management legislation

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 on at least one occasion and include:

- accessing, interpreting and applying regulatory requirements
- applying procedures for monitoring vessel operations and ensuring compliance with International Convention for the Prevention of Pollution from Ships (MARPOL) requirements are fully observed
- clearly explaining environmental management concepts, principles and procedures to others
- maintaining accurate environmental records
- maintaining actions to ensure a positive environmental reputation
- monitoring the implementation of environmental management plans, policy and procedures, and specified work methods
- regularly inspecting vessel for environmental risks and impacts
- responding to complaints and requests for information from authorities and authorised personnel.

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:

- ant-pollution procedures and all associated equipment
- environmental legislative/regulatory requirements and responsibilities relevant to the vessel
- environmental protection/management terminology, concepts and principles
- importance of proactive measures to protect the marine environment
- organisational environmental management plans, procedures, control measures and management actions for vessel
- organisational procedures for:
 - identifying and assessing environmental risks and impacts
 - managing stakeholder relations
 - responding to complaints and other environmental incidents
 - record management and reporting

- precautions to be taken to prevent pollution of the marine environment
- vessel characteristics and environmental issues, risks and impacts
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARJ004 Inspect and report defects and damage to vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to inspect and report defects and damage to vessels.

This unit applies to a Watchkeeper Deck, Master up to 500 gross tonnage (GT) and Master up to 80 metres Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

J – Environment

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 inspections	1.1	Elements of the vessel structure critical to the safety of the vessel are identified
	1.2	Location of defects and damage caused by vessel operations and the environment are ascertained
	1.3	Parts of the vessel to be inspected for defects and damage are identified

	1.4	Inspections are scheduled to ensure all parts are covered within a given time
	1.5	Damage control plan is developed to ensure the seaworthiness of the vessel
2 Check condition of vessel in normal and emergency situations	2.1	Organisational procedures for coverage and frequency of tests and inspections on the vessel are complied with
	2.2	Watertight integrity is checked and appropriate action is taken to prepare for prevailing and forecast weather and sea conditions
	2.3	Degree to which vessel is secured is appropriate to prevailing and forecast conditions
	2.4	Defects and damage are reliably detected and appropriate action is taken to rectify the situation
	2.5	Irregularities beyond own ability to rectify are recognised in time to enable remedial action to be taken
3 Prepare reports	3.1	Reports are completed and maintained as required according to regulatory and organisational requirements
	3.2	Relevant reports are sent to appropriate bodies and copies are filed according to regulatory and organisational requirements
	3.3	Documents are stored according to regulatory and organisational requirements

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.

Elements of the vessel structure include one or more of the following:	• ballast tanks • bulkheads • cargo holds • cargo tanks • frames • fresh water tanks
Defects and damage include one or more of the following:	• cargo operation damage • damage to structures through heavy weather • damage caused by corrosion • defects to ballast water tank vents
Vessel operations and the environment include one or more of the following:	• loading and unloading operations • severe weather conditions
Parts of the vessel include one or more of the following:	• cargo holds • deck structures • hatch covers • machinery spaces • ventilators and fire closing devices
Coverage includes one or more of the following:	• areas requiring inspection under the planned maintenance schedule and survey requirements
Reports include one or more of the following:	• defects and damage reports to management • inspection records • maintenance reports • survey reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARJ5002A Inspect and report defects and damage to 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 MARJ004 Inspect and report defects and damage to 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 on at least one occasion and include:

- adhering to procedures to distinguish between normal and defective or damaged parts of vessel
- developing damage control plans
- developing effective planning documents
- identifying those elements of the vessel structure that are critical to vessel safety
- inspecting and reporting defects and damage to cargo spaces, hatch covers and ballast tanks
- interpreting and following procedures for the coordination of planned maintenance processes
- preparing appropriate reports on inspection and maintenance outcomes.

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:

- causes of corrosion to cargo spaces and ballast tanks, and how corrosion can be identified and prevented
- construction, layout and subdivision of a vessel, including freeboard and bulkhead deck, watertight compartments, weather tight compartments, the bulkhead of the vessel and collision bulkhead
- corrosion control measures
- damage control measures that may be required to maintain the integrity of a hull in a range of typical emergency situations
- how to ensure reliable detection of defects and damages
- own ability and limits to rectify irregularities and faults
- parts of the vessel to be inspected each time in order to cover all parts within a given period
- planned maintenance systems for vessel and associated maintenance inspection procedures
- principal features of vessel structure
- principal stresses that act on vessel structure

- principles and procedures to ensure watertight integrity of vessel hull in both normal and emergency situations
- procedures for checking and inspecting vessel seaworthiness
- properties and application of materials used to construct vessels
- purpose of the enhanced survey program
- typical vessel construction features and stress characteristics
- where to look for damage and defects most commonly encountered due to loading and unloading operations, corrosion, severe weather conditions
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARK001 Handle a vessel up to 12 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manoeuvre a vessel up to 12 metres in length. This includes the ability to berth, moor, anchor and manoeuvre a vessel during emergencies.

This unit applies to people working as Coxswain Grade 1 Near Coastal and Coxswain Grade 2 Near Coastal on a range of vessels up to 12 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

K – Manoeuvring Vessels

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.

1 Handle vessel in normal conditions

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

- 1.1 Features of vessel that relate to its handling characteristics are recognised
- 1.2 Details of manoeuvres are communicated to relevant personnel clearly and concisely using standard maritime vocabulary
- 1.3 Situational awareness is maintained to ensure safety of

- manoeuvres
- 1.4 Manoeuvres are completed to meet passage requirements
 - 1.5 Propulsion equipment is used and monitored to assist in completing manoeuvres safely
 - 1.6 Safe operating limits of propulsion and steering equipment are not exceeded
- 2 Handle vessel in adverse weather conditions**
- 2.1 Nature of adverse weather conditions is identified and potential impact on the manoeuvrability of the vessel is determined
 - 2.2 Appropriate action is taken to ensure the safety of the vessel
 - 2.3 Propulsion equipment is used and monitored to assist in completing manoeuvres safely
 - 2.4 Safe operating limits of propulsion and steering equipment are not exceeded
 - 2.5 Situational awareness is maintained at all times to review actions and ensure the safety of the vessel
- 3 Handle vessel in emergencies**
- 3.1 Nature of emergency is established and required action is determined
 - 3.2 Risks to vessel and safety of persons on board are assessed and safety of required action is confirmed
 - 3.3 Details of action are communicated to relevant personnel clearly and concisely using standard maritime vocabulary
 - 3.4 Appropriate manoeuvres are made during the emergency to maintain the safety of the vessel and those on board, and any other vessels or persons involved
 - 3.5 Propulsion equipment is used and monitored to assist in completing manoeuvres safely
 - 3.6 Safe operating limits of propulsion and steering equipment are not exceeded
- 4 Tow and be towed**
- 4.1 Preparations for towing are made safely according to established nautical practice
 - 4.2 Correct towing procedures and precautions are applied when towing and being towed

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.

Features of vessel must include:

- displacement and planing hulls
- outboard and inboard propulsion units
- rudders and propellers
- stability
- trim and displacement

Manoeuvres must include:

- astern movements
- berthing and leaving a berth
- berthing and unberthing in a pen
- coming to and leaving mooring
- retrieval of person overboard
- turning a vessel across tide and wind
- turning short around in a limited space

Propulsion equipment must include:

- inboard engine
- outboard engine

Adverse weather conditions must include:

- fog and restricted visibility
- tropical revolving storm activity in the area
- wind and sea conditions that may affect the safety of the

vessel

Appropriate action must include:	• altering course to minimise the effect of wind and sea • deploying a sea anchor to keep vessel head to sea • heading to wind and sea to ride out the adverse weather • reduction of speed • seeking shelter
Nature of emergency must include:	• beaching • collision • disabled or partially disabled vessel • grounding • person overboard
Preparations for towing must include:	• communication with towed vessel • means of transferring towing line to or from the towed vessel • preparation of towing lines appropriate for the tow
Correct towing procedures must include:	• if the tow is manned, means of communication must be available • methods of securing the tow line must be capable of being slipped • towing lines and associated equipment must be of sufficient strength to ensure the tow can be safely conducted

Unit Mapping Information

This is a new unit. This unit is equivalent to MARK2001A Handle a vessel up to 12 metres.

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 MARK001 Handle a vessel up to 12 metres

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 on at least one occasion and include:

- anchoring a vessel
- handling a disabled or partially disabled vessel
- manoeuvring a vessel in:
 - bad weather
 - vicinity of large vessels
- manoeuvring a vessel through:
 - berthing and leaving a berth in various wind and tidal conditions
 - berthing and unberthing in a pen
 - coming to and leaving a mooring
 - person overboard
 - steering astern through an 's' configuration
 - towing and being towed in varying weather conditions
 - turning short around in a limited space
 - turning a vessel across the tide across the wind
- manoeuvring to beach and refloat the vessel
- maintaining situational awareness
- using appropriate communication.

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:

- avoidance of tropical revolving storm activity
- effects of:
 - displacement and planing hulls
 - jet units
 - outboard and inboard propulsion units
 - rudders and propellers

- features of a vessel that relate to its handling characteristics
- manoeuvring characteristics of small power-driven vessels (heavily laden and lightly laden)
- maritime publications and procedures relating to emergency response
- procedures for towing and being towed
- stability of a small vessel and stability terms
- techniques for crossing a coastal bar with and against the sea
- techniques for handling a vessel in heavy swell and surf
- trim and displacement
- use of a sea anchor
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARK002 Manoeuvre a vessel up to 24 metres within near coastal waters

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manoeuvre a vessel of up to 24 metres in length within near coastal waters.

This unit applies to people working in maritime industry in the capacity of Master on a range of vessels up to 24 metres within near coastal waters. The limit of near coastal waters is the Exclusive Economic Zone (EEZ), which in Australia is 200 nautical miles.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

K – Manoeuvring Vessels

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 Manoeuvre vessel in normal conditions	1.1	Features of vessel that relate to its handling characteristics are recognised
	1.2	Details of manoeuvres are communicated to relevant personnel clearly and concisely using standard maritime vocabulary

- 1.3 Situational awareness is maintained to ensure safe manoeuvres
- 1.4 Manoeuvres are completed to meet passage requirements
- 1.5 Propulsion equipment is used and monitored to assist in completing manoeuvres safely
- 1.6 Appropriate alterations to vessel heading are made in response to operational environment
- 1.7 Safe operating limits of propulsion and steering equipment are not exceeded
- 2 Manoeuvre vessel in adverse weather conditions**
 - 2.1 Nature of adverse weather conditions is identified and the potential impact on the manoeuvrability of the vessel is determined
 - 2.2 Appropriate action is taken to ensure the safety of vessel
 - 2.3 Propulsion equipment is used and monitored to assist in completing actions safely
 - 2.4 Heading is maintained within acceptable limits
 - 2.5 Appropriate allowance is made for effects of deadweight, draft, trim, speed and underwater keel clearances during turning circles and stopping distance
 - 2.6 Safe operating limits of propulsion and steering equipment are not exceeded
 - 2.7 Situational awareness is maintained at all times to review actions and ensure safety of vessel
- 3 Manoeuvre vessel in emergencies**
 - 3.1 Nature of the emergency is established and required action is determined
 - 3.2 Risks to the vessel and the safety of persons on board are assessed and safety of required action is confirmed
 - 3.3 Details of action are communicated to relevant personnel clearly and concisely using standard maritime vocabulary
 - 3.4 Appropriate manoeuvres are made during the emergency to maintain the safety of the vessel and those on board, and any other vessels or persons involved
 - 3.5 Propulsion equipment is used and monitored to assist in

- completing actions safely
- 3.6 Safe operating limits of propulsion and steering equipment are not exceeded
- 4 Tow and be towed**
- 4.1 Preparations for towing are safely made according to established nautical practice
- 4.2 Correct towing procedures and precautions are applied when towing and being towed

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.

Features of vessel include one or more of the following:

- displacement and planing hulls
- propulsion units
- rudders and propellers

Manoeuvres must include:

- astern movements
- berthing and leaving a berth
- berthing in a pen
- coming to and leaving mooring
- positioning vessel to safely launch boats or life rafts in bad weather
- retrieval of person overboard
- turning a vessel across tide and wind

	• turning short around • Williamson turn
Situational awareness include one or more of the following:	• other vessels in the vicinity of the manoeuvre • own vessel position in relation to shallow water and other obstructions • weather conditions that may affect the manoeuvre
Propulsion equipment includes one or more of the following:	• inboard engine • inboard/outboard engine • jet propulsion engine • outboard engine
Adverse weather conditions includes one or more of the following:	• fog and restricted visibility • wind and sea conditions that may affect the safety of the vessel
Appropriate action includes one or more of the following:	• altering course to minimise the effect of wind and sea • deploying a sea anchor to keep vessel head to sea • heading to wind and sea to ride out the adverse weather • reducing speed • seeking shelter
Nature of the emergency includes one or more of the following:	• beaching • collision • damage to the vessel • disabled or partially disabled vessel • fire • grounding • injury or death • loss of steering gear • person overboard
Preparations for towing includes one or more of the following:	• crew briefings that include the task at hand and risks to persons on both vessels • ensuring appropriate lights and shapes for the tow are available and in working order • ensuring means of communication between the two vessels is

available

- ensuring tow ropes are in good condition and of adequate strength for the proposed tow
- making appropriate reports to authorities
- preparing messenger ropes for passing tow lines

Correct towing procedures include one or more of the following:

- ensuring tow line is of sufficient length to minimise shockloading on tow-line
- making tow fast to the towing vessel to ensure steerage can be maintained
- making provision for rapid slipping of the tow in emergency situations

Unit Mapping Information

This is a new unit. This unit is equivalent to MARK3001A Manoeuvre a vessel up to 24 metres within near coastal waters.

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 MARK002 Manoeuvre a vessel up to 24 metres within near coastal waters

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 on at least one occasion and include:

- anchoring a vessel
- determining required action for a range of emergency situations
- handling a disabled or partially disabled vessel
- issuing helm and engine orders
- manoeuvring a vessel through:
 - berthing and leaving a berth in various wind and tidal conditions
 - berthing in a pen
 - coming to and leaving a mooring
 - person overboard
 - towing and being towed
 - turn short around
 - turning a vessel across the tide across the wind
- manoeuvring a vessel to approach an anchorage
- maintaining situational awareness
- manoeuvring to assist vessels in distress
- using a sea anchor.

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:

- effects of displacement and planing hulls
- effects of inboard propulsion units
- effects of rudders and propellers
- effects of interaction with passing or moored vessels
- factors that could adversely affect vessel safety during operations
- features of a vessel that relate to its handling characteristics
- lessening drift and use of oil
- launching boats or life rafts

- manoeuvring characteristics of a vessel:
 - in heavy weather
 - in heavy swell and surf
 - crossing a bar
 - in a narrow channel or shallow water
- manoeuvring a vessel astern
- manoeuvring characteristics to beach and refloat the vessel
- manoeuvring characteristics to assist a vessel or aircraft in search and rescue
- means of keeping a vessel out of a trough
- manoeuvring a vessel to position for helicopter evacuation
- precautions in manoeuvring or launching boats or life rafts in bad weather
- procedures for towing and being towed
- techniques for crossing a coastal bar with and against the sea
- trim and displacement
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARK003 Manoeuvre a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manoeuvre a vessel up to 80 metres.

This unit applies to people working in the maritime industry 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

K – Manoeuvring Vessels

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 Manoeuvre vessel in normal conditions

1.1	Features of vessel that relate to its handling characteristics are recognised
1.2	Adequate resources are organised prior to and during operations
1.3	Details of manoeuvres are communicated to relevant personnel clearly and concisely using standard maritime vocabulary

- 1.4 Situational awareness is maintained to ensure safe manoeuvres
- 1.5 Manoeuvres are completed in relevant conditions of tide and wind to meet passage requirements
- 1.6 Propulsion equipment is used and monitored to assist in completing manoeuvres safely
- 1.7 Appropriate alterations to vessel heading and power are made in response to operational environment
- 1.8 Safe operating limits of propulsion and steering systems are not exceeded
- 2 Manoeuvre vessel in adverse weather conditions**
 - 2.1 Nature of adverse weather conditions is identified and implications for vessel operations are evaluated
 - 2.2 Preparations are made and required precautions are taken to minimise risk and damage to vessel, personnel and time loss on passage
 - 2.3 Manoeuvres are adjusted to allow for weather and sea conditions, and to keep vessel in safe water
 - 2.4 Propulsion equipment is used and monitored to assist in completing actions safely
 - 2.5 Heading is maintained within acceptable limits
 - 2.6 Appropriate allowance is made for effects of deadweight, draft, trim, speed and underwater keel clearances during turning circles and stopping distance
 - 2.7 Safe operating limits of propulsion and steering equipment are not exceeded
 - 2.8 Situational awareness is maintained at all times to review actions and ensure safety of vessel
- 3 Manoeuvre vessel in emergencies**
 - 3.1 Nature of emergency is established and required action is determined
 - 3.2 Risks to vessel and safety of persons on board is assessed and safety of required action is confirmed
 - 3.3 Details of action are communicated to relevant personnel clearly and concisely using standard maritime vocabulary

	3.4	Appropriate manoeuvres are made during emergency to maintain safety of vessel and those on board, and any other vessels or persons involved
	3.5	Propulsion equipment is used and monitored to assist in completing actions safely
	3.6	Safe operating limits of propulsion and steering equipment are not exceeded
	3.7	Special handling techniques are correctly applied during launching of boats or life rafts and rescues of persons overboard
4	Tow and be towed	
	4.1	Preparations for towing are safely made according to established nautical practice
	4.2	Correct towing procedures and precautions are applied when towing and being towed

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.

Features of vessel include one or more of the following:

- displacement and planing hulls
- propulsion units
- rudders and propellers

- Manoeuvres must include:
- astern movements
 - berthing and leaving a berth
 - berthing in a pen
 - coming to and leaving mooring
 - positioning vessel to safely launch boats or life rafts in bad weather
 - retrieval of person overboard
 - turning short around
 - turning vessel across tide and wind
- Propulsion equipment include one or more of the following:
- inboard engine
 - outboard engine
 - inboard/outboard engine
 - jet propulsion engine
- Adverse weather conditions includes one or more of the following:
- fog and restricted visibility
 - wind and sea conditions that may affect safety of vessel
- Nature of emergencies include one or more of the following:
- beaching
 - collision
 - damage to vessel
 - disabled or partially disabled vessel
 - fire
 - grounding
 - loss of steering gear
 - person overboard
- Preparations for towing include one or more of the following:
- ensuring appropriate lights and shapes for the tow are available and in working order
 - ensuring means of communication between the two vessels is available
 - ensuring tow ropes are in good condition and of adequate strength for proposed tow
 - making appropriate reports to authorities
 - preparing messenger ropes for passing tow lines
- Correct towing procedures
- ensuring tow line is of sufficient length

- include one or more of the following:
- making provision for rapid slipping of tow in emergency situations
 - making tow fast to towing vessel to ensure steerage is maintained

Unit Mapping Information

This is a new unit. This unit is equivalent to MARK4001A Manoeuvre a vessel up to 80 metres.

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 MARK003 Manoeuvre a vessel up to 80 metres

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 on at least one occasion and include:

- anchoring a vessel
- determining required action for a range of emergency situations
- handling a disabled or partially disabled vessel
- issuing helm and engine orders
- manoeuvring a vessel in:
 - bad weather
 - in heavy swell and surf
 - crossing a bar
 - following and quartering seas
- manoeuvring a vessel in normal and emergency situations
- manoeuvring a vessel through:
 - berthing and leaving a berth and anchor work in various wind and tidal conditions
 - berthing and unberthing
 - coming to and leaving a mooring
 - person overboard
 - steering astern through an 's' configuration
 - towing and being towed
 - turn short around
 - turning a vessel across the tide across the wind
- manoeuvring a vessel to embark or disembark a pilot
- manoeuvring in shallow water
- maintaining situational awareness.

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:

- effects of displacement and planing hulls
- effects of inboard propulsion units

- effects of rudders and propellers
- factors that could adversely affect vessel safety during operations
- features of a vessel that relate to its handling characteristics
- interaction with passing vessels , banks and shallow water
- launching boats or life rafts
- lessening drift and use of oil
- manoeuvres assisting a vessel or aircraft in distress
- manoeuvres to beach and refloat the vessel
- manoeuvring characteristics
- means of keeping a vessel out of a trough
- methods of taking on board survivors from lifeboats and life rafts
- precautions in manoeuvring or launching boats or life rafts in bad weather
- procedures for towing and being towed
- radio communications
- requirements for entering, departing and crossing a traffic separation area
- techniques for crossing a coastal bar with and against the sea
- trim and displacement
- use of a sea anchor
- 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARK004 Perform basic vessel manoeuvres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform basic manoeuvres on a vessel in normal operating conditions and in emergencies under the direction of the Master.

This unit applies to maritime workers working in the maritime industry as a Watchkeeper Deck; as a Master, Chief Mate or Watchkeeper Deck on ships of less than 500 gross tonnage (GT) in any operating area; as a Master or Chief Mate of vessels less than 3000 GT operating in near coastal waters; as a Master up to 80 metres Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

K – Manoeuvring Vessels

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 Manoeuvre vessel in normal operations

1.1	Vessel heading is maintained within acceptable limits to meet the requirements of the operating situation
1.2	Alterations of heading and power are smooth and controlled
1.3	Suitable mode of steering is selected for the manoeuvre to meet the requirements of the operating situation

- 1.4 Constant rate of turn techniques are used to achieve constant radius turns during manoeuvres
- 1.5 Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres
- 1.6 Orders of the Master are followed to assist in anchoring and berthing operations
- 2 **Make adjustments to vessel course and speed to maintain safe navigation**
 - 2.1 Effects of operational environment on vessel performance are evaluated at regular intervals
 - 2.2 Implications of the changed operational environment on vessel handling are assessed
 - 2.3 Appropriate alterations to vessel heading and power are made in response to the assessment of the operational environment
- 3 **Manoeuvre vessel during adverse weather**
 - 3.1 Impending adverse weather conditions are identified and implications for vessel operations are evaluated
 - 3.2 Preparations are made to minimise risk and damage to vessel and personnel
 - 3.3 Communications are made with engine room to ensure main engines are readied for manoeuvring
 - 3.4 Master is advised of developments in sea and weather conditions
 - 3.5 Vessel heading and power is maintained in response to adverse weather and sea conditions
- 4 **Manoeuvre vessel in emergencies under Master's instructions**
 - 4.1 Nature of emergency is established and initial action is taken
 - 4.2 Risk to the vessel and the safety of persons on board is assessed and Master is informed
 - 4.3 Appropriate manoeuvres under Master's instructions are made during the emergency to maintain the safety of the vessel
 - 4.4 Propulsion equipment is used and monitored to assist in completing actions safely
 - 4.5 Safe operating limits of propulsion and steering equipment are not exceeded

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.

Operating situation must include:	• headreach • requirements of the manoeuvre • safe water • stopping distances • tide • weather

Suitable mode of steering must include:	• automatic pilot • emergency steering • manual steering

Orders include one or more of the following:	• communication with tugs and pilot vessel • communications with Vessel Traffic Services • engine • helm • internal communication with engine room and berthing stations

Anchoring and berthing operations include one or more of the following:	• manoeuvring in: • shallow waters • estuaries • rivers

- restricted waters

Operational environment includes one or more of the following:

- heavy traffic areas
- ice
- marine park areas
- shallow and restricted waters
- traffic separation zones

Alterations must include:

- adjustment of speed to assist collision avoidance
- allowance for current and wind
- appropriate speed in reduced visibility
- speed adjustment for heavy weather conditions

Adverse weather conditions include one or more of the following:

- fog and restricted visibility
- wind and sea conditions that may impact on the safety of the vessel

Preparations include one or more of the following:

- advice to Master
- allocation of extra lookouts
- reduction in speed
- resources to engage manual steering

Nature of emergency includes one or more of the following:

- beaching
- collision
- damage to the vessel
- disabled or partially disabled vessel
- fire
- grounding
- loss of steering gear
- person overboard

Unit Mapping Information

This is a new unit. This unit is equivalent to MARK5001A Perform basic vessel manoeuvres.

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 MARK004 Perform basic vessel manoeuvres

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 on at least one occasion and include:

- handling a disabled or partially disabled vessel
- implementing anchoring and berthing procedures
- issuing helm and engine orders
- maintaining situational awareness
- manoeuvring a vessel:
 - in bad weather
 - in heavy swell
 - through coming to and leaving a mooring
- manoeuvring for the rescue of person overboard
- manoeuvring in shallow water
- recognising emergency situations.

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:

- effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances
- effects of wind and current on vessel handling
- effects on vessel handling of wind, currents and bottom topography
- features of a vessel that relate to its handling characteristics
- manoeuvring and engine characteristics for various vessels more than 500 gross tonnage
- manoeuvring problems for vessels more than 500 gross tonnage and appropriate action and solutions
- manoeuvring procedures in and near traffic separation schemes and vessel traffic service areas
- methods for controlling vessel speed and direction
- one's surroundings and changes to these surroundings
- procedures for the rescue of person overboard
- procedures for turning a vessel in various situations

- proper procedures for anchoring and mooring
- safe operating limits of propulsion and power systems, and steering equipment
- squat, shallow-water and similar effects on vessel handling
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL001 Carry out engineering calculations

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to carry out calculations related to fuel consumption, fuel storage and engine performance that conform to accepted engineering tolerances.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 fuel consumption and storage

- 1.1 Information required for calculations related to fuel consumption and storage is obtained from relevant sources
- 1.2 Calculations are completed to accepted working tolerances
- 1.3 Results of calculations are verified
- 1.4 Results of calculations are applied to managing fuel as

		required
2 Complete calculations related to engine performance	2.1	Information required for calculations related to engine performance is obtained from relevant sources
	2.2	Calculations are completed to accepted working tolerances
	2.3	Results of calculations are verified
	2.4	Results of calculations are applied to managing engine performance as required

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.

- Calculations related to fuel consumption and storage must include:
- calculations involving:
 - specific fuel consumption
 - volume and capacity of regular shaped tanks
 - pumping capacities for tank filling and emptying
 - consumption of fuel and lubricating oil
 - hourly fuel consumption
 - requirements for replenishing lubricating oil in oil tank
 - using calibration tables to measure quantities in tanks
 - using relative density/specific gravity to convert quantity in litres and volume to mass

Calculations related to engine performance must include:

- calculations involving:
 - theoretical steaming times
 - distances covered
 - specific power, speed and range
 - theoretical steaming times
 - mechanical advantage, load, effort moments
 - stress, strain and safe working load
- remaining steaming times

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL4001A Carry out engineering calculations.

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 MARL001 Carry out engineering calculations

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 on at least one occasion and include:

- calculating:
 - area and circumference of a circle
 - consumption of fuel and lubricating oil for a particular voyage, using quantity in litres and mass in tonnes and specified regular shaped tanks
 - distances covered
 - hourly fuel consumption
 - mechanical advantage, load, effort moments
 - pumping capacities for tank filling and emptying
 - remaining steaming times
 - requirements for replenishing lubricating oil in oil tank
 - specific fuel consumption, power, speed and range
 - stress, strain and safe working load
 - tank capacities and pumping capacities for tank filling and emptying
 - theoretical steaming times
 - velocity ratio and efficiency of simple machines
 - volume and capacity of regular shaped tanks
- converting:
 - fractions to decimals
 - units to multiples of base units
- performing accurate and reliable calculations
- using calibration tables to measure quantities in tanks
- using relative density/specific gravity to convert quantity in litres and volume.

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:

- area and circumference of a circle

- calibration tables
- common SI units such as kilogram, tonne, Newton, Newton metre, Pascal, joule, watt and metre
- relationship between theoretical vessel speed, propeller pitch and revolutions per minute (RPM)
- terminology of:
 - simple levers
 - material technology
- volumes of regular shaped tanks
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL002 Apply basic principles of naval architecture

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform basic calculations related to the seaworthiness of commercial vessels, including those dealing with watertight integrity and vessel stability.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 shipboard areas and volumes	1.1 Basic principal structural members of ship and proper names of various parts are detailed
	1.2 Simpson's Rules are applied to calculate shipboard areas
	1.3 Simpson's Rules are applied to calculate shipboard volumes

2 Calculate vessel displacement	2.1	Tonnes per centimetre (TPC) values and Simpson's Rules are applied to calculate vessel displacement
	2.2	Calculations are performed using TPC values and Simpson's Rules to solve problems related to vessel displacement
3 Calculate ship dimensions	3.1	Ship form dimensions are calculated using coefficients for areas
	3.2	Ship form coefficients for underwater volumes are calculated
	3.3	Influence of common hull modifications on hull form coefficients is explained
	3.4	Calculations are performed to solve problems of ship form coefficients following change to vessel length resulting from mid body insertion or removal
4 Explain position of centre of gravity of vessel in relation to its keel and midships	4.1	Centre of gravity calculations for a vessel are performed
	4.2	How centre of gravity changes with redistribution, addition and/or removal of mass is explained
	4.3	How addition, removal or transfer of mass may cause overturning moments is identified
	4.4	Problems are solved involving addition, removal and vertical movement of mass by performing centre of gravity calculations for typical vessel loaded conditions
	4.5	Calculations are performed using results from inclining experiments to obtain initial stability characteristics
5 Explain effects of water density and flooding of mid-length compartment on vessel draft	5.1	Relationship between changes in underwater volume and changes in water density is outlined
	5.2	Fresh water allowance of a vessel is determined
	5.3	Change in mean draft for vessel movement between waters of different densities is calculated
	5.4	Volume lost-volume gained relationship for flooded compartments is explained
	5.5	Calculations are performed to solve problems of mid-length compartment flooding in simple box-shaped hull forms
	5.6	Fundamental actions to be taken in the event of partial loss of intact buoyancy are identified

6 Perform calculations related to propellers and vessel speed	6.1	Relationship between propellers and vessel speed is explained
	6.2	Problems related to vessel speed and propellers are solved by calculating theoretical, apparent and true speeds, apparent and true slips, wake speed and Taylor wake fraction
	6.3	Impact of fouling on vessel hull and propeller is outlined
7 Calculate voyage and daily fuel consumptions	7.1	Fuel consumption is determined by applying admiralty coefficient for fuel consumption taking account of ship speed, shaft power and displacement
	7.2	Calculations are performed to solve problems of vessel fuel consumption taking account of ship speed, shaft power and displacement
	7.3	Impact of fouling on vessel fuel consumption is explained
8 Calculate pressures and loads on surfaces due to hydrostatics	8.1	Standard formula for hydrostatic pressure is defined
	8.2	Hydrostatic load on vertical and horizontal surfaces is calculated
	8.3	Method of calculating loads on typical tank structures for different filling rates is explained

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.

Shipboard areas include one or more of the following:

- bulkheads
- elemental areas
- water planes

Shipboard volumes include one of the following:

- transverse sectional areas
- water plane areas

Problems related to vessel displacement include one of the following:

- addition of mass
- removal of mass

Coefficients for areas include one of the following:

- midships (CM)
- waterplane (CW)

Coefficients for underwater volumes include one of the following:

- block (Cb)
- prismatic (Cp)

Centre of gravity includes one or more of the following:

- centre of gravity (CG)
- longitudinal centre of gravity (LCG)
- vertical centre of gravity (VCG)

Mass includes one or more of the following:

- ballast
- cargo
- fuel
- passengers

Filling rates include one or more of the following:

- accidental flooding
- tank testing

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5004A Apply basic principles of naval architecture.

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 MARL002 Apply basic principles of naval architecture

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 on at least one occasion and include:

- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic principles of naval architecture
- identifying and applying relevant mathematical formulas and techniques to solve basic problems related to speed, fuel consumption and stability of commercial vessels
- identifying and interpreting numerical and graphical information, and performing mathematical calculations related to shipboard areas and volumes, vessel displacement, ship dimensions, centre of gravity, vessel speed, fuel consumption and hydrostatic pressure
- identifying, collating and processing information required to perform calculations related to speed, fuel consumption and stability of commercial vessels
- imparting knowledge and ideas through verbal, written and visual means
- performing accurate and reliable calculations
- reading and interpreting written information needed to perform calculations related to the seaworthiness of commercial vessels
- solving problems using appropriate laws and principles
- using calculators to perform mathematical calculations.

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:

- basic structural members of a ship and the proper names of the various parts
- buoyancy
 - centre of gravity:
 - centre of gravity (CG), longitudinal centre of gravity (LCG), vertical centre of gravity (VCG)
 - calculations
- density correction formula
- fuel consumption calculations

- hydrostatic pressure
- principle of displacement
- ship:
 - stability
 - stability calculations
 - measurements
 - displacement
- shipboard:
 - areas
 - volumes
- Simpson's Rules
- Tonnes per centimetre (TPC) immersion
- trim and stress tables, diagrams and stress calculating equipment
- vessel speed calculations
- watertight integrity.

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.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL003 Demonstrate basic knowledge of marine auxiliary boilers

Modification History

Release 1. new unit of competency.

Application

This unit involves the knowledge required to operate and maintain marine auxiliary boilers on a commercial vessel.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Distinguish between different types of auxiliary boilers	1.1 Design and use of water tube and fire tube auxiliary boilers are compared and contrasted
	1.2 Movement of water and gas in an operating boiler is sketched
	1.3 How variations to operating pressure and saturation temperature in an auxiliary boiler can be used to get wet, dry

			or superheated steam is explained
2	Recognise different functions of steam and different components of steam systems	2.1	Key features of steam and other heating systems are compared and contrasted
		2.2	Steam side requirements of an auxiliary steam turbo alternator are compared and contrasted with other steam-powered machinery
		2.3	Typical steam and condensate system is outlined
3	Explain fuel oil system of auxiliary boilers	3.1	Combustion process is explained and factors that affect combustion in a boiler are outlined
		3.2	Differentiation is made between different burner types
		3.3	Operation of a complete fuel oil system for an auxiliary boiler including the functions of components for automatic combustion control is outlined
4	Explain procedure for operating fired and unfired boilers	4.1	Locations of all mountings and fittings on auxiliary boilers are identified and their functions are outlined
		4.2	Purpose of all alarms and shut downs incorporated in auxiliary boilers is clarified
		4.3	Types and operation of safety valves are outlined
		4.4	Procedure for lighting off a boiler from cold is clarified
		4.5	Procedure for laying up for short and long periods including full blow down and shut down procedures is clarified
		4.6	Procedure for isolating an auxiliary boiler after shut down is clarified
5	Explain procedure for sampling and testing boiler water	5.1	Effects of poor water treatment practices on safety and boiler function are identified
		5.2	Correct procedure for taking boiler and feed water sample and possible errors that might occur are clarified
		5.3	Common water tests carried out are outlined and typical results are stated
		5.4	Chemicals used for treatment of boiler water are named and acceptable range of chemical reserves found in boiler waters are confirmed
6	Explain procedure	6.1	Method of testing and changing a gauge glass is outlined

	for maintaining water level in the boiler	6.2	Effects of blockages in water, steam and drain cocks on levels in gauge glass are outlined
		6.3	Procedure for when a gauge glass apparently shows no water is clarified
7	Explain common hazards and defects and relevant prevention/ control procedures	7.1	Hazards and defects associated with auxiliary boilers are identified
		7.2	How water hammer can be prevented in auxiliary boilers is outlined
		7.3	Symptoms, causes, effects and actions to be taken in the event of oil contamination of boiler water are determined
		7.4	Difference between and measures taken to avoid fire and water side explosions are clarified
		7.5	Causes, mechanism, prevention and control of economiser fires are detailed

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.

Mountings and fittings on auxiliary boilers include one or more of the following:

- air release cock
- auxiliary steam stop valve
- blow down valve
- feed check or control valve

- main steam stop valve
- pressure gauge connection
- safety valves
- sampling connection
- scum valve
- water level gauge
- whistle stop valve

Hazards and defects include one or more of the following:

- chemical hazards
- enclosed space
- illumination of work area
- machine guarding
- manual handling
- materials
- rubbish and combustible
- steam and fuel leaks
- thermal hazards
- trips

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5005A Demonstrate basic knowledge of marine auxiliary boilers.

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 MARL003 Demonstrate basic knowledge of marine auxiliary boilers

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 on at least one occasion and include:

- accessing information related to marine auxiliary boilers
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic operation of marine auxiliary boilers
- identifying and applying relevant solutions for addressing problems associated with marine auxiliary boilers
- identifying and interpreting diagnostic information and performing mathematical calculations related to operating, maintaining and repairing marine auxiliary boilers
- identifying methods, procedures and materials needed for operating, maintaining and repairing marine auxiliary boilers
- imparting knowledge and ideas through verbal, written and visual means
- providing accurate and reliable information
- providing appropriate level of detail in responses
- reading and interpreting manuals, technical specifications, safety data sheets/material safety data sheets and manufacturer guides related to operating, maintaining and repairing marine auxiliary boilers.

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:

- basic principles of operation of boilers and steam systems
- combustion in boilers and related safety procedures, including importance of purging a boiler and other safety precautions taken when firing a boiler
- common boiler defects and repair procedures
- fuel oil system for an auxiliary boiler
- fittings mounted on boilers
- hazards associated with running boiler plant
- operating principles relating to steam generation in fired and unfired boilers
- principles of boiler operation in normal and emergency situations

- procedures for maintaining water level in boilers
- purpose of alarms and shut downs in marine boilers
- treatment, sampling and testing of boiler water
- types of auxiliary boilers and typical operating pressures and temperatures
- typical feed systems for marine boilers
- work health and safety (WHS)/occupational health and safety (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 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL004 Demonstrate basic knowledge of marine auxiliary machinery and equipment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate and maintain auxiliary machinery and associated systems on board a commercial vessel.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Outline layout of engine room and functions of auxiliary machinery in engine room

- 1.1 Layout of a typical engine room is outlined
- 1.2 Types and functions of auxiliary machinery found in an engine room are explained
- 1.3 Location, function and operation of all safety devices found on main and auxiliary machinery and within engine room,

		including shut downs and engine room escape routes is outlined
	1.4	Common operating pressures and temperatures of fluids within engine room are identified and how to respond to abnormal parameters is clarified
2 Explain duties and responsibilities of a watchkeeper engineer during a watch	2.1	Duties and responsibilities of a watchkeeper engineer with respect to safety of personnel and vessel during and taking over the watch are clarified
	2.2	Importance of ensuring all events related to machinery are recorded in the log is explained
	2.3	Duties and responsibilities of a watchkeeper engineer in prevention and extinction of fire in machinery spaces are clarified
	2.4	Duties and responsibilities of a watchkeeper engineer in relation to prevention of flooding and avoidance of pollution are clarified
	2.5	Routine duties and responsibilities of a watchkeeper engineer with respect to safe operation of propulsion and auxiliary machinery are clarified
	2.6	Duties and responsibilities of a watchkeeper engineer on an unmanned machinery space (UMS) vessel are clarified
	2.7	Procedure for familiarising oneself on joining a new vessel is clarified
3 Recognise key features, applications and treatment of fuels, lubricants and chemicals used on board vessels	3.1	Types, properties, applications and treatments of various fuels used on board vessels are outlined
	3.2	Procedures to be followed before and during fuel bunkering are clarified
	3.3	Types, properties, applications and treatments of various lubricants used on board vessels are outlined
	3.4	Uses and safe handling methods for various types of chemicals used on board vessels are outlined
	3.5	Fuel system layout including fuel treatment method is detailed
	3.6	Working principle, construction and safe operation of purifiers and clarifiers is explained

4 Explain operation and maintenance of typical pumping systems used on board vessels	4.1	Basic working principles, components and properties of different types of pumps are outlined
	4.2	Types of heat exchangers, their basic working principles and applications are outlined
	4.3	Correct operation and maintenance of pumps and heat exchangers is detailed
	4.4	Key features of bilge, cargo and ballast pumping systems are outlined
	4.5	Types, operating principles and requirements for oily-water separators or similar equipment are outlined
	4.6	Other approved methods of disposing of oily water are identified
	4.7	Procedure for completing oil record book is clarified
5 Explain operation and maintenance of marine air compressors	5.1	Types, characteristics, components and applications of various compressors used on board vessels are compared and contrasted
	5.2	Correct pre-operational checks, starting procedure, safe operation and basic maintenance required for air compressors are detailed
	5.3	Potential safety hazards associated with compressed air are identified
	5.4	Locations of all mountings, safety devices, alarms and shut downs on compressors, air receivers and compressed air systems are identified and their functions are outlined
	5.5	Different requirements and production methods for control air, method of production and special requirements for a breathing apparatus compressor, are clarified
6 Explain different types, safe operation and testing of steering gear commonly used on board vessels	6.1	Essential statutory regulations covering operation of steering gear are established
	6.2	Operation of different types of steering gear used on board vessels is clarified
	6.3	Working principle of variable delivery pumps used in steering gear is explained
	6.4	Location of all alarms and safety devices associated with

		steering gear is identified and their functions are outlined
	6.5	Process for testing steering gear and monitoring its performance is explained
7 Explain operation of an evaporator	7.1	Why ‘fresh water’ may have to be produced from seawater is explained
	7.2	Function, construction and operation of evaporators is explained
	7.3	Correct starting procedure, safe operation and basic maintenance required for an evaporator is clarified
	7.4	Process for testing the evaporator and monitoring performance is explained
	7.5	Treatment of distillate for domestic purposes is outlined
	7.6	Quality necessary if water being produced by a distiller is to be used for human consumption is outlined
8 Explain basic operation of marine refrigeration systems	8.1	Properties of an ideal refrigerant are listed
	8.2	Refrigerants commonly used on board are listed and reason for their use is clarified
	8.3	Basic construction and operation of a marine refrigeration system is explained
	8.4	Preparation, operation, fault detection and necessary actions to prevent damage in marine refrigeration systems is confirmed
	8.5	Personal safety and environmental hazards associated with CFCs and ozone depleting substances are identified
9 Explain basic operation of marine air-conditioning and ventilation systems	9.1	Basic construction and operation of marine air-conditioning and ventilation systems in routine and emergency situations is explained
	9.2	Preparation, operation, fault detection and necessary actions to prevent damage in marine air-conditioning and ventilation systems is confirmed
10 Explain basic operation of marine gas turbines	10.1	Basic flow of air and gas through a simple cycle marine gas turbine is outlined
	10.2	Materials and construction of compressor, combustion system and turbine in a single and two-shaft design turbine

		are detailed
	10.3	Basic controls required for the control and protection of the plant are outlined
	10.4	Accessories necessary for safe operation are listed
11 Explain types, safe operation and maintenance of deck machinery	11.1	Types, basic construction and operation of deck machinery are outlined
	11.2	Preparation, operation, fault detection and necessary actions to prevent damage in deck machinery is confirmed

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.

Types of auxiliary machinery include one or more of the following:	• boiler • compressors • diesel generator • evaporators • pumps • refrigerating installation • separators
Functions of auxiliary machines include one or	• applying main power of engines for propulsion and manoeuvring • keeping ship dry and trimmed • mooring ship and handling cargo

- more of the following:
- providing for safety
 - supplying domestic needs such as fresh water
 - supplying needs of main engines and boilers
 - supplying ship with electric power and lighting

- Types of chemicals include one or more of the following:
- cleaning fluids
 - fuel additives
 - solvents

- Types of pumps include one or more of the following:
- axial flow
 - centrifugal
 - gear
 - reciprocating
 - screw
 - vane

- Types of heat exchangers include one or more of the following:
- plate
 - shell and tube

- Features of bilge, cargo and ballast pumping systems include one or more of the following:
- safety fittings
 - sensing devices
 - types of valves

- Compressors include one or more of the following:
- breathing apparatus compressor
 - lubricated reciprocating air compressors
 - non-lubricated reciprocating air compressors
 - oil free air compressors
 - rotary screw compressors

- Types of steering gear include one or more of the following:
- electrical
 - ram
 - rotary vane
 - oscillating steering

Steering gear includes one or more of the following:

- hunting gear
- telemotor

Accessories include one or more of the following:

- accessory gear
- lube oil coolers
- lube oil drive
- lube oil filter
- starting device

Deck machinery includes one or more of the following:

- accommodation ladders
- anchor winch
- cranes
- davits
- mooring winch

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5006A Demonstrate basic knowledge of marine auxiliary machinery and equipment.

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 MARL004 Demonstrate basic knowledge of marine auxiliary machinery and equipment

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 on at least one occasion and include:

- accessing information and sketching diagrams to interpret and explain testing requirements related to the operation of marine auxiliary machines
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic principles of marine auxiliary machines
- identifying and interpreting numerical and graphical information related to starting up and shutting down marine auxiliary machines on commercial vessels
- identifying and suggesting ways of rectifying faults and malfunctions in marine auxiliary machines on commercial vessels
- identifying methods, procedures and materials needed for operating, maintaining and repairing marine auxiliary machines on commercial vessels
- imparting knowledge and ideas through verbal, written and visual means
- providing accurate and reliable information
- providing appropriate level of detail in responses
- reading and interpreting written information related to the operation, performance and maintenance of marine auxiliary machines, including machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams.

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:

- fuels and basic principles of fuel systems
- nature and causes of typical start up and shut down malfunctions of main and auxiliary machinery and associated systems, and available methods for their detection and rectification
- operational characteristics and performance specifications for different types of auxiliary machinery and associated systems usually found on a commercial vessel, including pumps, air compressors, steering gears, heat exchangers and evaporators
- principles and procedures of machinery lubrication

- procedures for carrying out start up and shut down of main and auxiliary machinery and associated systems to ensure compliance with company and survey requirements and regulations
- purpose and content of safety data sheets/material safety data sheets
- safety, environmental and hazard control precautions and procedures relevant to start up and shut down of marine auxiliary machinery and associated systems
- types of auxiliary machinery and components
- work health and safety (WHS)/occupational health and safety (OHS) legislation and policies.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL005 Demonstrate basic knowledge of marine control systems and automation

Modification History

Release 1. New unit of competency.

Application

This unit involves the knowledge of marine automation and process control required by engineers to operate control systems on board a commercial vessel.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Outline basic actions and functions of automation equipment in marine contexts	1.1	Basic concept of an automatic control system is explained using a simple block diagram, correct Australian Standard symbols and layout
	1.2	Components and operation of automatic control systems are outlined

		1.3	Relative advantages and disadvantages of different mediums used in shipboard automatic control systems are explained
2	Explain action of nozzle flapper mechanism in pneumatic instruments	2.1	Principle of operation of nozzle/flapper as a pneumatic control system component is outlined
		2.2	Modifications required to make the simple nozzle/flapper mechanism suitable for use in process control systems are explained
3	Explain operating principles and application of sensing and transmitting elements	3.1	Different methods of measuring level in an unpressurised tank and in a closed pressurised vessel are sketched and outlined
		3.2	Applications at sea, advantages and disadvantages and temperature ranges of filled system thermometers are outlined
		3.3	Operating principles of resistance temperature detector and thermocouple are outlined
		3.4	Different methods for measuring flow on board ships that are suited to remote indication and automatic control are identified
		3.5	Different methods for measuring pressure on board a ship that are suited to remote indication and automatic control are identified
4	Explain function of controller element and associated hand/auto changeover station in an analogue control loop	4.1	Difference between ‘off-on’ control action and fully modulating proportional control action is explained
		4.2	‘Offset’ and how it may be removed is explained
		4.3	Basic principles of operation of a simple pneumatic controller are outlined
		4.4	Action and function of hand/auto change over station in an automatic control loop is explained, using suitable schematic diagrams
5	Explain basic operating principles of electronic circuits and components	5.1	Components are identified and electronic circuit diagrams are interpreted
		5.2	Correct methods of testing electronic components are detailed
		5.3	Basic operation of operational amplifiers is outlined

6	Explain use of solid state diodes and transistors to control monitoring and alarm systems	6.1	Basic concept of logic and operation of logic gates is outlined
		6.2	Operation of input/output devices and their application to sequential control systems are explained
7	Explain ‘fail safe’ philosophy and its implications for design and operation of main types of actuators available for operating final correcting elements	7.1	Purpose and function of a typical valve actuator and positioner are confirmed
		7.2	Constructional differences between typical ‘air-to-open’ and ‘air-to-close’ actuators are confirmed
		7.3	Why ‘fail safe’ may mean valves could either close, open, or remain where they are, upon failure of their associated automatic (or servo remote) operating system, is clarified
		7.4	Pneumatic piston actuator/positioner assembly used to move final correcting elements pneumatically is outlined
		7.5	Operating principles of electrical actuators are outlined
8	Specify requirements for a pneumatic control system air supply	7.6	Operation of a hydraulic steering gear actuator is compared and contrasted with valve actuator and positioner assemblies
		8.1	Standard specifications for cleanliness, moisture and oil content of a typical control air system are outlined
		8.2	Importance of ensuring that standards for cleanliness, moisture and oil content are maintained throughout operation of control air system is explained
9	Explain mechanisms for control of physical parameters in a ship’s machinery space	8.3	Typical system that is able to supply compressed air that meets required standards for cleanliness, moisture and oil content is outlined
		9.1	Typical control loops associated with centralised cooling systems that serve the cooling water system are sketched
		9.2	Function of typical loops required for control of temperature, pressure and viscosity of fuel supplies to main and auxiliary engines are outlined and sketched
		9.3	Typical pressure and temperature control loops associated with main and auxiliary engine lubricating oil services are sketched
		9.4	Function of components of typical control loops for the automatic control of boilers are outlined and sketched

	9.5	Location and reasons for alarms associated with remote and/or automatic machinery operation to be separate from control function are explained
	9.6	Tests and procedures required to meet unmanned machinery space (UMS) requirements are specified and different types of associated alarm and monitoring systems are evaluated
	9.7	Power output and control of a main propulsion diesel engine (slow speed two-stroke) and an electrical generator prime mover (high or medium speed four-stroke) are compared and contrasted
10 Explain schematically total bridge control of a commercial vessel	10.1	Engine manufacturer schematic diagram is interpreted and how Total Bridge control may be achieved to manoeuvre and control the engine is explained
	10.2	Safety interlocks in sequence of operation depicted in schematic diagram are identified and why they are required is explained
	10.3	Location of engine control positions, apart from the bridge, is identified from schematic diagram
	10.4	Why bridge control is preferred option for manoeuvring main engine in modern commercial vessels is explained

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.

Components include one or more of the following:

- actuators
- responders
- sensors

Mediums include one or more of the following:

- compressed air
- electric currents
- electric voltages
- hydraulic fluids

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5007A Demonstrate basic knowledge of marine control systems and automation.

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 MARL005 Demonstrate basic knowledge of marine control systems and automation

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 on at least one occasion and include:

- accessing information and sketching diagrams to interpret and explain testing requirements related to control systems on commercial vessels
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic principles of marine automation and process control
- identifying and interpreting numerical and graphical information, including schematic diagrams, relevant to control systems on commercial vessels
- identifying and suggesting ways of rectifying faults and malfunctions in control systems on commercial vessels
- identifying methods, procedures and materials needed to operate and maintain control systems on commercial vessels
- imparting knowledge and ideas through verbal, written and visual means
- providing accurate and reliable information
- providing appropriate level of detail in responses
- reading and interpreting written information related to the operation of control systems on commercial vessels.

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:

- Australian Standards for drawing symbols/layouts for schematic diagrams
- characteristics and functions of temperature, pressure and viscosity of fuel
- concept of 'fail safe' philosophy
- concepts of machinery space (UMS), and automated monitoring and control of machinery
- control and monitoring of ship machinery
- control loops
- instrument process and control terms
- mechanical and electrical sensors
- pneumatic and electrical instrumentation transmitters

- principles of:
 - process control
 - basic pneumatic systems and action of pneumatic instruments
 - basic electronic circuits
- safety devices, alarms and monitoring systems
- sensing and transmitting elements
- tests and procedures required to meet UMS requirements
- total bridge control
- work health and safety (WHS)/occupational health and safety (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 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL006 Demonstrate basic knowledge of marine diesel engines and systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the knowledge required to operate and maintain marine diesel engines and systems on a commercial vessel.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Outline stages of combustion in two-stroke and four-stroke cycle diesel engines

1.1	Two-stroke and four-stroke cycle diesel engines are compared and contrasted
1.2	Methods and diagnostic information used in determining engine combustion characteristics are specified
1.3	Diagnostic information is used to identify and interpret

			common combustion faults and to produce typical diagrams for analysing faults
2	Explain means of pressure- charging diesel engines	2.1	Pressure-charging principles and their influence on engine design and waste heat recovery are explained
		2.2	Different methods of pressure-charging diesel engines are clarified
		2.3	Emergency isolation procedures used when pressure-charging diesel engines are clarified
3	Explain operation of diesel engine governors	3.1	Governing principles, common governor types and related controls are outlined
		3.2	Different requirements for governing diesel engines for propulsion and power generation are explained
		3.3	Problems of mismatched engine sizes/prime mover types when sharing common loads are outlined
4	Explain properties of materials used in construction of engine components	4.1	Properties of materials used in construction of engine components are specified
		4.2	Dynamic stresses and loads, materials and service limitations of engine components are outlined
		4.3	Construction and operating cycle forces of diesel engine components are outlined
		4.4	Relationship between critical speed, use of detuners/dampers and materials in engine components is clarified
5	Explain safe working practices associated with diesel engines during maintenance, repair and operation	5.1	Safe practices for isolating propulsion and power generation diesel engines prior to work commencement are confirmed
		5.2	Safety protective clothing to be used during all aspects of diesel maintenance is identified
		5.3	Hazards associated with working on diesel engines and systems including working in enclosed spaces are identified
		5.4	Correct procedures for using hydraulic tools and high-pressure fuel injection test equipment are clarified
		5.5	Purpose, operation and maintenance of safety interlocks and protective cut-outs of engine manoeuvring systems is determined
6	Explain procedures	6.1	Causes, symptoms and means of preventing and

for preventing and responding to crankcase and airline explosions, and scavenge and uptake fires

- extinguishing uptake and economiser fires are outlined
- 6.2 Risks of continued service with an isolated waste heat unit are assessed
- 6.3 Causes, symptoms, methods of extinguishing and prevention of scavenge fires are evaluated
- 6.4 Causes and hazards associated with starting airline explosions are identified
- 6.5 Protective devices fitted to air starting systems to minimise risk of explosion, and routine inspection and maintenance required are detailed
- 6.6 Causes and ways of preventing crankcase explosions in both diesel and dual-fuel engines are outlined
- 6.7 Procedure to be taken in the event of an early warning of a hazardous crankcase atmosphere and required procedure to be followed after engine has stopped are clarified

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.

Diagnostic information includes one or more of the following:

- engine efficiency
- fuel consumption
- temperature

-
- Common combustion faults include one or more of the following:
 - engine cylinder fuel supply
 - lack of total combustion
- Methods of pressure-charging diesel engines include one or more of the following:
 - exhaust gas turbo charging
 - positive displacement engine-driven blowers
 - under-piston assistance
- Diesel engine components include one or more of the following:
 - bedplates
 - camshafts
 - crankshafts
 - cross-heads
 - cylinder heads
 - exhaust valves
 - frames
 - fuel injectors
 - fuel pumps
 - liners
 - pistons
 - tie-rods for two- or four-stroke engines
 - turbochargers
 - valves and rocket gear
- Hazards include one or more of the following:
 - acids
 - chemicals
 - defective or bypassed machinery protective devices
 - defective or inappropriately adjusted exhaust systems
 - enclosed spaces
 - flammable liquids under pressure
 - hydrocarbons
 - lifting heavy components both unaided and with lifting gear
 - leaking oil and fuel
- Causes include one or more of the following:
 - airlock in feed water system
 - cleanliness of economiser tubes
 - failure of economiser feed pump

- loss of feed-water supply

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5008A Demonstrate basic knowledge of marine diesel engines and systems.

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 MARL006 Demonstrate basic knowledge of marine diesel engines and systems

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 on at least one occasion and include:

- accessing diagnostic information related to marine diesel engines and systems
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic operation of marine diesel engines and systems
- identifying and applying relevant solutions for addressing problems associated with marine diesel engines and systems
- identifying and interpreting diagnostic information, and performing mathematical calculations related to operating, maintaining and repairing marine diesel engines and systems
- identifying methods, procedures and materials needed for operating, maintaining and repairing marine diesel engines and systems
- imparting knowledge and ideas through verbal, written and visual means
- providing accurate and reliable information
- providing appropriate level of detail in responses
- reading and interpreting manuals, technical specifications, safety data sheets/material safety data sheets and manufacturer guides related to operating, maintaining and repairing marine diesel engines and systems.

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:

- basic principles of diesel engine operation
- components of diesel engines
- crankcase and air-line explosions, scavenge and uptake fires
- diesel engine
- diesel engine:
 - lubrication systems
 - propulsion and power generation
- manoeuvring systems of diesel engines

- pressure-charging diesel engines, including common service faults, actions to rectify faults, emergency operation and isolation procedures
- properties and characteristics of fires
- safe working practices associated with diesel engines during operation, maintenance, and repair
- starting methods of diesel engines
- work health and safety (WHS)/occupational health and safety (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 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL007 Demonstrate basic knowledge of marine electrical systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate alternators, generators and control systems to supply shipboard electrical power on board a commercial vessel.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Explain hazards and isolation procedures associated with live electrical components	1.1	Effects of electricity on the human body are outlined
	1.2	Procedure to be taken in the event of a person suffering an electric shock is clarified
	1.3	Correct procedure for isolating an electrical circuit is clarified

	1.4	Electrical hazards in a vessel at sea or port are identified
2 Explain basic operation of and hazards associated with marine high voltage installations	2.1	Functional and operational requirements for a marine high voltage system are detailed
	2.2	Safety procedures required when working in high voltage environments are outlined
	2.3	Procedure for assisting suitably qualified personnel to carry out maintenance and repair of high voltage switchgear of various types is outlined
3 Explain principles of power generation and transmission in AC and DC circuits	3.1	Excitation methods used to produce alternating current (AC) and direct current (DC) voltages are outlined
	3.2	Basic voltage control of generated AC voltages is outlined
4 Outline key features of basic electrical diagrams used on vessels	4.1	Types of diagrams used to depict electrical systems on ships are outlined
	4.2	Electrical symbols used in basic electrical diagrams are identified
	4.3	Electrical devices used in basic electrical circuits are clarified
5 Use common electrical measuring and testing instruments	5.1	Different types of multimeters are used appropriately
	5.2	Functions of insulation and ‘tong’ testers are explained
	5.3	Safety requirements when using test equipment are applied
6 Rectify basic electrical faults	6.1	Fault situation is determined by appropriate questioning of client or operator
	6.2	Safe working practices are demonstrated when carrying out fault-finding work
	6.3	Basic common faults of equipment and techniques used to find faults are outlined
	6.4	Knowledge of various types of basic common faults of circuits and techniques is used to find faults
	6.5	Basic common faults in electrical equipment are identified and rectified
7 Outline basic components and layout of a marine electrical	7.1	Layout of a typical three wire insulated electrical system is sketched
	7.2	Interconnections between main switchboard, emergency

switchboard		switchboard and shore supply are explained	
		7.3	Procedure for changing over to emergency switchboard for testing or during loss of mains power is outlined
		7.4	Safety features on a typical marine switchboard are identified
8 Explain operation of shipboard alternators	8.1	Types and construction methods of alternators used on a marine vessel are outlined	
	8.2	Principles of operation of a marine type alternator are outlined	
	8.3	Relationship is shown between voltage and speed in regulation of alternator	
	8.4	Operational characteristics of a marine alternator are outlined	
	8.5	Excitation and automatic voltage regulation systems used with marine alternators are clarified	
9 Explain procedures for paralleling of alternators	9.1	Process of measuring voltage, frequency and phase angle is outlined	
	9.2	Automatic and manual procedures for synchronising and paralleling marine alternators, including machines of different capacities are clarified	
	9.3	How two machines can be adjusted to share kVAR and kW loads is confirmed	
	9.4	Process of removing an alternator from the bus is outlined	

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.

Electrical hazards include one or more of the following:

- electric shock
- electrical fire
- moving and rotating electrical equipment
- non-compliance with safe working procedures
- over-speed of electrical machinery
- poor housekeeping procedures
- using equipment beyond safe working limits

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5009A Demonstrate basic knowledge of marine electrical systems.

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 MARL007 Demonstrate basic knowledge of marine electrical systems

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 on at least one occasion and include:

- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic principles of alternators, generators and control systems
- identifying and interpreting numerical and graphical information in electrical diagrams and specifications for a commercial vessel
- identifying and suggesting ways of rectifying electrical hazards and emergency situations on a vessel
- identifying methods, procedures and materials needed for operating, maintaining and repairing basic marine electrical systems
- imparting knowledge and ideas through verbal, written and visual means
- providing accurate and reliable information
- providing appropriate level of detail in responses
- reading and interpreting written information related to electrical circuitry and components on commercial vessels
- using electrical measuring and testing instruments.

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:

- AC/DC voltage
- alternators:
 - construction
 - characteristics
 - synchronised operation
- electrical:
 - safe working practices
 - measuring and testing instruments
 - symbols, basic electrical diagrams/circuits
- marine electrical systems:

- switchboards
- instrumentation
- earthing
- phase angle, power factor and current flow
- procedures for dealing with hazards and emergencies
- resistance, inductance and capacitance
- switchboards and protection:
 - purpose
 - testing and maintenance
 - equipment removal
- work health and safety (WHS)/occupational health and safety (OHS) legislation and policies.

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.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL008 Demonstrate basic knowledge of ships and ship routines

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to maintain a safe engineering watch on a commercial vessel.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Outline key features of different types of commercial ships	1.1 Annotated sketch of profile and midship section of a range of ship types is constructed
	1.2 Terms used to quote size of a ship are used appropriately
	1.3 Plate materials and joining methods used in ship construction are detailed

	1.4	Basic principles of watertight integrity are identified and applied
	1.5	Shipping terms are applied to describe characteristics of commercial vessels
2 Explain dangers associated with entry into engine room spaces	2.1	How atmosphere in engine room spaces may be hazardous is detailed
	2.2	Procedures for obtaining permission to enter engine room spaces are outlined
	2.3	Administrative procedures applying to work in engine room after normal hours are outlined
3 Explain need for standards and other monitoring requirements for ships	3.1	International standards relating to construction, equipment and conditions of commercial vessels are outlined
	3.2	National legislation and International Maritime Organization (IMO) conventions concerning safety of life at sea, security and protection of marine environment are outlined
	3.3	Requirements of International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM) Code and safety management system are outlined
	3.4	Qualifications and experience requirements for key personnel on a ship are outlined
	3.5	Personal and ship certificates, and other documents required to be carried on board ship by international conventions, how they are obtained, how they may be verified and period of their legal validity are identified
	3.6	Roles and functions of key national and international shipping authorities and organisations are outlined
	3.7	Purpose of surveys and dry-docking of ships are explained
4 Explain responsibilities of personnel on board ship	4.1	Roles and responsibilities of personnel on board ship are clarified
	4.2	Organisational structure, lines of responsibility and communication on board ship are outlined
	4.3	International maritime conventions, recommendations and national legislation concerning shipboard personnel and training are clarified

	4.4	Daily work and shipboard routines relating to engineering watchkeeping are outlined
	4.5	Personal and social responsibilities of personnel on board ship are confirmed
5 Explain engineering watchkeeping procedures	5.1	Established marine engineering practice and regulatory requirements for conduct, handover and relief of an engineering watch are outlined
	5.2	Operational procedures and requirements for main propulsion, auxiliary systems and associated controls are outlined
	5.3	Operational procedures and requirements for monitoring the performance of main propulsion, auxiliary systems and associated controls are outlined
	5.4	Procedures for identifying, rectifying and reporting problems associated with performance of main propulsion, auxiliary systems and associated controls are outlined
	5.5	Basic operation, monitoring and maintenance of shafting installations and propeller systems is detailed
	5.6	Engine room resource management principles and procedures required for a safe engineering watch are outlined
	5.7	Safety precautions to be observed during a watch and immediate action to be taken in the event of fire or accident are clarified
	5.8	Requirements for recording activities and incidents that occur during keeping an engineering watch are detailed
	5.9	Fatigue management strategies for engine room management team are identified
	5.10	Personal task and workload management techniques appropriate for an engineering watchkeeper are outlined
6 Outline procedures and responses to malfunctions and emergency situations	6.1	Potential malfunctions and emergencies relating to main propulsion and auxiliary systems are identified
	6.2	Correct response and required action relating to potential malfunctions and emergencies in main propulsion and auxiliary systems are detailed
	6.3	Regulatory requirements and reporting requirements for incidents and emergency situations outside watchkeeper

limits of responsibility are confirmed

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.

Ship types include one or more of the following:

- bulk carrier
- container
- general dry cargo
- passenger
- ro-ro
- tanker

Shipping terms include one or more of the following:

- hogging
- panting
- pounding
- racking
- sagging

Key personnel includes one or more of the following:

- crew
- master
- officers

Shipping organisations

- Australian Maritime Safety Authority (AMSA)

and authorities include one or more of the following:

- classification societies
- IMO
- National Maritime Safety Committee
- state and territory marine authorities

Personal and social responsibilities include one or more of the following:

- alcohol and drug abuse
- discipline
- finance
- health and fitness
- hygiene
- relationships
- safety

Engine room resource management principles include one or more of the following:

- allocation, assignment and prioritisation of resources
- assertiveness and leadership
- considering team experience
- effective communication
- obtaining and maintaining situational awareness

Personal task and workload management techniques include one or more of the following:

- coordination
- managing resource constraints
- managing time constraints
- personnel assignment
- planning

Potential malfunctions and emergencies include one or more of the following:

- accidents
- breakdowns
- collisions
- explosion fire
- flooding
- groundings

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5011A Demonstrate basic knowledge of ships and ship routines.

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 MARL008 Demonstrate basic knowledge of ships and ship routines

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 on at least one occasion and include:

- access information required to undertake watchkeeping duties in routine and emergency situations
- apply effective decision making techniques
- assess own work outcomes and maintain knowledge of current codes, standards, regulations and industry practices
- develop, implement and oversee standard operating procedures
- identify and determine appropriate ways of responding to malfunctions and emergency situations in daily watchkeeping operations
- identify, interpret and process numerical and graphical information required to undertake watchkeeping duties in routine and emergency situations
- identify methods and procedures needed to implement watchkeeping duties on commercial vessels
- read and interpret written instructions, procedures and information relevant to watchkeeping duties.

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:

- bridge instrumentation, controls and alarms
- bridge resource management systems
- causes of groundings, collisions and casualties
- composition of bridge/engine room management team
- enclosed spaces
- engineering watchkeeping procedures and practices
- fatigue management principles and techniques
- functions of unmanned machinery space (UMS) controls, alarms and indicators
- hierarchy and organisational structure of shipboard personnel
- key international and Australian Standards relating to shipping
- key shipping authorities and organisations

- maritime communication techniques
- navigational hazards and implications for watchkeeping
- personal and social responsibilities on board ship
- procedures for dealing with malfunctions and emergencies
- rudder and propeller control and vessel manoeuvring characteristics
- sections of International Maritime Organization (IMO) Standards of Training, Certification & Watchkeeping (STCW) Convention and Codes and Australian Maritime Safety Authority (AMSA) Marine Orders dealing with watchkeeping principles, arrangements, procedures, roles and responsibilities
- signs of fatigue
- types of ships and key features of ships
- watch handover procedures
- work health and safety (WHS)/occupational health and safety (OHS) legislation and policies.

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.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARL009 Perform basic marine engineering calculations

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform basic marine engineering calculations required for the operation of marine machinery and equipment.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

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 Apply mathematical formulae to solve marine engineering problems	1.1	Proportions, variation, percentages and averages are calculated, and method of unity is applied
	1.2	Problems involving the manipulation of indices are solved
	1.3	Written descriptions of actual or hypothetical marine engineering problems are expressed in mathematical terms

	1.4	Algebraic formulae and equations are manipulated to change subjects, as and when required
	1.5	Index problems are converted to logarithmic problems, and vice versa, according to the Law of Logarithms
	1.6	Calculator is used to resolve marine engineering problems
2 Calculate areas, volumes and masses of regular and irregular figures	2.1	Problems related to areas and volumes of regular geometric figures are solved using standard formulae
	2.2	Problems relating to surface areas and volumes of circular figures are solved
	2.3	Centres of gravity and centroids of area are found for both line figures and areas
	2.4	Concept of density is applied to calculate masses
3 Apply trigonometry to solve problems relating to angular measurement and the resolution of vectors	3.1	Basic trigonometric ratios of sine, cosine and tangent, together with their reciprocals are explained with respect to the sides of a right-angled triangle
	3.2	Pythagoras' Theorem is proved
	3.3	Problems associated with single angle trigonometric identities including those derived from the application of Pythagoras' Theorem to the basic sin, cos and tan identities are solved
	3.4	Derivation of multiple, double and half angle trigonometric identities are shown and used to simplify complicated trigonometric expressions and identities
	3.5	Sine Rule and Cosine Rule for solution of triangles are proved and applied

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.

Not Applicable.

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5012A Perform basic marine engineering calculations.

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 MARL009 Perform basic marine engineering calculations

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 on at least one occasion and include:

- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic mathematical concepts and techniques relevant to marine engineering, and
- identifying and determining appropriate mathematical techniques and formula to solve marine engineering problems
- identifying the methods and procedures needed to select mathematical techniques and formula to solve marine engineering problems
- imparting knowledge and ideas through verbal, written and visual means
- performing accurate and reliable calculations
- performing calculations relevant to marine engineering, including volumes and masses of regular and irregular areas
- reading and interpreting written information on marine engineering problems and express this information in mathematical terms
- solving problems using appropriate laws and principles
- using a calculator to resolve marine engineering problems.

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), longitudinal centre of gravity (LCG), vertical centre of gravity (VCG)
- centroids of area
- formulae for areas, volumes and masses of regular and irregular shapes
- indices
- Law of Logarithms
- proportions, variation, percentages, averages and method of unity
- Pythagoras' Theorem.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARN001 Apply general purpose hand skills aboard a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform general purpose hand duties aboard a vessel.

This unit applies to general purpose hands working in the maritime industry on vessels up to 80 metres. They could be working independently or as part of a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

N – Seamanship

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 Use and maintain ropes

- 1.1 Rope types and common areas of use are correctly identified
- 1.2 Ropes are checked for wear and any damage is reported according to workplace procedures
- 1.3 Ropes are coiled and stowed correctly
- 1.4 Knots and hitches are tied neatly and securely, and are used according to their correct application

	1.5	Ropes are spliced neatly and securely according to their correct application and rope ends are whipped where instructed, to maintain good condition
2 Operate deck machinery and emergency stops	2.1	Prior to use, deck machinery is checked and prepared for operation
	2.2	Operations are carried out safely according to instructions and standard operating procedures (SOPs) or organisational safety management system (SMS)
	2.3	Emergency stops on motor and machinery are operated in response to an emergency situation
3 Assist in securing vessel at anchor	3.1	Prior to letting go, anchor and equipment are prepared as instructed and organisational communications are followed
	3.2	Instructions provided are complied with in relation to quantity of anchor cable run out or recovered
	3.3	During operation, control of cable is maintained within safe operating limits
	3.4	On completion of anchoring operations, anchor and equipment are secured according to instructions
	3.5	Throughout all operations, anchoring area is kept free of loose ropes, wires and debris
4 Assist in securing and adjusting vessel position during mooring operations	4.1	At all times, mooring lines and associated equipment are handled safely
	4.2	Mooring plan and organisational communications are followed
	4.3	Throughout mooring operations, mooring area is kept free of loose ropes, wires and debris
	4.4	Tension on ropes is maintained at an appropriate level for the stage and nature of the operation
	4.5	Mooring lines are secured according to instructions provided
	4.6	Equipment malfunction or problems encountered during operations are promptly reported
5 Assist in securing vessel for sea	5.1	Cargo and cargo handling equipment are checked to ensure they are stowed securely

- 5.2 Hatches and openings are checked to ensure they are secured as required
 - 5.3 Maintenance equipment is returned to storage location and secured
 - 5.4 Assistance is provided in testing equipment as instructed
 - 5.5 All mooring lines are stowed and secured
 - 5.6 Assistance is provided in stowing the gangway
- 6 Perform tasks aloft and over vessel side**
 - 6.1 Area and equipment for working aloft or over the side are prepared as instructed
 - 6.2 Required precautions are taken when working aloft or over the side
 - 6.3 Chairs, safety harnesses and appropriate safety equipment are used according to workplace procedures
 - 6.4 Tasks are completed safely according to instructions and organisational SMS
 - 6.5 After use, equipment is maintained and stored
- 7 Assist with safe refuelling operations**
 - 7.1 All personal protective equipment is accessed and used
 - 7.2 Safety boundary for the refuelling process is established
 - 7.3 Instructions are followed to ensure spill prevention systems are correctly deployed
 - 7.4 Instructions are followed in completing tasks related to the refuelling or fuel transfer process

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.

Rope types include one or more of the following:	• braided • Kevlar • natural fibre • polyester • plaited • wire core rope • wire rope
Knots and hitches must include:	• bowline • clove hitch • eye splice • reef knot • round turn and two half hitches • rolling hitch • short splice
Deck machinery includes one or more of the following:	• capstans • cranes • derricks • winches • windlasses
Operations must include:	• anchoring in varying weather conditions • berthing and unberthing • loading or discharging
Mooring lines include one or more of the following:	• back springs • bow and stern ropes • breast lines • fore and aft springs

Mooring operations include one or more of the following:

- adjustments from both fore and aft mooring positions
- making fast and letting go to a single-point mooring
- making fast and letting go fore and aft to a wharf
- rigging and recovering means of access to the vessel

Tasks include one or more of the following:

- hull maintenance
- painting
- renewing wires and ropes

Unit Mapping Information

This is a new unit. This unit is equivalent to MARN1001A Apply general purpose hand skills aboard a 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 MARN001 Apply general purpose hand skills aboard a 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 on at least one occasion and include:

- anchoring in varying weather conditions
- assisting in different types of mooring operations
- handling ropes and wires
- implementing safe and environmentally responsible work practices
- lashing cargo
- performing an eye splice, back splice and a short splice
- performing common whipping on ropes
- securing equipment and objects for sea passage, transit in port or ready for use
- tying common knots, bends and hitches
- using capstans
- using cranes and derricks
- using different anchoring and mooring winches
- using synthetic rope and wire mooring lines.

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:

- anchor cable markings
- characteristics of different types of mooring ropes
- construction of different types of rope
- correct application of common knots, bends and hitches
- correct terminology
- different configurations of mooring lines for various parts of a vessel
- different types of anchor
- emergency stop procedures
- hazards that could occur if the operation is not properly controlled
- maintenance of different types of rope
- means of access

- organisational:
 - safety management system (SMS)
 - standard operating procedures (SOPs)
- procedures for working in confined spaces
- refuelling procedures
- requirements for access equipment
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARN002 Apply seamanship skills aboard a vessel up to 12 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply practical seamanship skills and techniques as part of work duties aboard a vessel up to 12 metres.

This unit applies to Coxswain Grade 1 Near Coastal and Coxswain Grade 2 Near Coastal working in the maritime industry on vessels up to 12 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

N – Seamanship

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 Use and maintain ropes

- 1.1 Rope types and common areas of use are correctly identified
- 1.2 Ropes are checked for wear and repairs are undertaken according to manufacturer guidelines
- 1.3 Ropes are coiled and stowed correctly
- 1.4 Knots and hitches are tied neatly and securely, and are used

- according to their correct application
- 1.5 Ropes are spliced neatly and securely according to their correct application
 - 1.6 Rope ends are whipped where appropriate to maintain good condition
- 2 Secure vessel at anchor**
- 2.1 Prior to letting go, anchor and equipment are prepared
 - 2.2 Quantity of anchor cable run out or recovered is appropriate to the depth of water, weather and sea conditions, and tidal range in area of operation
 - 2.3 During operation, control of cable is maintained within safe operating limits
 - 2.4 Degree to which anchor and equipment are secured on completion of anchoring operations is appropriate to forecast conditions
 - 2.5 During all operations, anchoring area is kept free of loose ropes, wires and debris
- 3 Secure vessel at a berth**
- 3.1 At all times, mooring lines and associated equipment are handled safely
 - 3.2 Throughout operations, mooring area is kept free of loose ropes, wires and debris
 - 3.3 Tension on ropes is maintained at an appropriate level for the stage and nature of the operation
- 4 Check condition and seaworthiness of vessel**
- 4.1 Coverage and frequency of checks and inspections on vessel seaworthiness are undertaken according to workplace procedures and organisational safety management system
 - 4.2 Watertight integrity is checked and appropriate action is taken to prepare for prevailing and forecast weather and sea conditions
 - 4.3 Degree to which vessel is secured is appropriate to prevailing and forecast conditions
 - 4.4 Irregularities are identified and appropriate action is taken to rectify the situation
 - 4.5 Irregularities beyond ability to rectify are reported in time to enable remedial action to be taken

	4.6	Reports of condition are completed according to workplace procedures
5 Conduct refuelling operations	5.1	All personal protective equipment is accessed and used
	5.2	Safety boundary for the refuelling process is established
	5.3	Spill prevention systems are correctly deployed
	5.4	Refuelling operations are performed safely and according to organisational safety management system

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.

Rope types include one or more of the following:	• braided • Kevlar • natural fibre • plaited • polyester • wire core rope • wire rope

Knots and hitches include one or more of the following:	• bowline • clove hitch • eye splice

- reef knot
- rolling hitch
- round turn and two half hitches
- short splice

Anchor and equipment includes one or more of the following:

- anchor buoy
- anchor securing arrangements
- sea anchor
- single anchor
- twin anchor
- windlass

Mooring lines include one or more of the following:

- back springs
- bow and stern ropes
- breast lines
- fore and aft springs

Coverage includes one or more of the following

- accommodation spaces
- engine room
- galley
- navigation lights
- personal facilities
- storage spaces
- trailer lights
- wheelhouse

Secured includes one or more of the following:

- accommodation and storage spaces
- anchors
- galley, stores and equipment
- materials on deck and below
- large objects likely to move in a sea way
- openings

Irregularities include one or more of the following:

- factors affecting the safety and integrity of:
 - crew
 - equipment
 - materials, such as cargo
 - vessel

Unit Mapping Information

This is a new unit. This unit is equivalent to MARN2001A Apply seamanship skills aboard a vessel up to 12 metres.

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 MARN002 Apply seamanship skills aboard a vessel up to 12 metres

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 on at least one occasion and include:

- being aware of own ability and limits to rectify irregularities and faults
- checking seaworthiness and general condition of a vessel up to 12 metres
- coiling and stowing ropes
- handling ropes
- identifying deterioration and causes in hull and fittings
- performing an eye splice and a short splice
- performing common whipping on ropes
- performing letting go and weighing anchor
- preparing and throwing a heaving line
- providing the required amount of detail in reports
- refuelling a vessel according to safety regulations and organisational safety management system requirements
- securing a vessel alongside using vessel mooring lines
- tying reef-knot, bowline, clove hitch, round turn and two half hitches, rolling hitch
- using a sea anchor as emergency steering.

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:

- basic structural parts of a small vessel
- considerations to make when selecting an anchorage
- correct application of common knots and hitches
- how to make a vessel watertight
- loading, discharging and movement of weights
- maintenance of synthetic and natural fibre ropes
- mooring line arrangements for securing at a berth
- principles of maintaining watertight integrity
- procedure for anchoring
- procedure for deploying a sea-anchor

- types of anchors used on small vessels up to 12 metres
- 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARN003 Perform seamanship operations on board a vessel up to 24 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply practical seamanship skills and techniques as part of operations on board a vessel up to 24 metres.

This unit applies to a Master working in the maritime industry on vessels up to 24 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

N – Seamanship

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 Use and maintain ropes and wires

- 1.1 Knots, hitches and bends using rope are correctly made and used in the course of operations on board a vessel
- 1.2 Ropes are spliced neatly and securely according to their correct application and rope ends are whipped where appropriate to maintain good condition
- 1.3 Breaking strain and safe working loads of rope and wire are determined and applied as load limits in the course of

- operations on board a vessel
- 1.4 Wear and damage to rope and wire are recognised
 - 1.5 Rope and wire are maintained and stored according to organisational procedures
- 2 Operate lifting gear**
- 2.1 Lifting gear is checked and prepared for operation prior to use
 - 2.2 Defective lifting gear is isolated and reported according to organisational procedures
 - 2.3 Loads are correctly attached using appropriate slings and rigging gear according to organisational procedures and safety requirements
 - 2.4 Maximum and safe working load limits are determined and not exceeded
 - 2.5 Lifting gear is safely operated to carry out operations
- 3 Secure vessel at anchor**
- 3.1 Prior to letting go, anchor and equipment are prepared and crew is briefed
 - 3.2 Quantity of anchor cable run out or recovered is appropriate to depth of water, weather and sea conditions, and tidal range in area of operation
 - 3.3 Control of cable is maintained within safe operating limits during anchoring operations
 - 3.4 Degree to which anchor and equipment are secured on completion of anchoring operations is appropriate to forecast conditions
 - 3.5 Anchoring area is kept free of loose ropes, wires and debris during all operations
- 4 Secure vessel at a berth**
- 4.1 At all times, mooring lines and associated equipment are handled safely
 - 4.2 Throughout operations, mooring area is kept free of loose ropes, wires and debris
 - 4.3 Tension on ropes is maintained at an appropriate level for stage and nature of the operation
 - 4.4 Tension on shore-power leads and other umbilicals is monitored

5 Check condition and seaworthiness of vessel	5.1 Coverage and frequency of checks and inspections on vessel seaworthiness are undertaken according to organisational procedures 5.2 Watertight integrity is checked and appropriate action is taken to prepare for prevailing and forecast weather and sea conditions according to vessel seaworthiness plans and regulatory requirements 5.3 Vessel is secured to degree which is appropriate to prevailing and forecast conditions 5.4 Irregularities are identified and appropriate action is taken to rectify the situation 5.5 Irregularities beyond ability to rectify are reported in time to enable remedial action to be taken 5.6 Reports of vessel condition are completed according to organisational procedures
6 Check stability of vessel	6.1 Information from vessel stability data book is used to determine loading limits and displacement from draft 6.2 Stability conditions for proposed nature of voyage and operations are confirmed and required stress and stability criteria are met
7 Perform tasks aloft and over vessel side	7.1 Area and equipment for working aloft or over the side are prepared according to organisational procedures 7.2 Required precautions are taken when working aloft or over the side 7.3 Chairs, safety harnesses and appropriate safety equipment are used according to organisational procedures 7.4 Portable ladders are used correctly to perform tasks 7.5 Tasks are completed safely according to instructions 7.6 Equipment is inspected, maintained and stored after use according to organisational procedures
8 Lash and secure stores, cargo and access ways	8.1 Lashing equipment is inspected, maintained and correctly stored after use according to organisational procedures 8.2 Cargo is stowed according to recognised principles and organisational procedures relating to transport and handling

- of dangerous goods
- 8.3 Cargo is lashed and secured according to recognised principles and organisational procedures
- 8.4 Equipment and items on deck and in galley spaces are secured according to organisational procedures
- 8.5 Personnel access ways are rigged and secured according to organisational procedures
- 8.6 Accommodation spaces and personnel facilities on board vessel are checked and correctly secured for sea according to organisational procedures
- 9 Supervise refuelling operations**
 - 9.1 All personal protective equipment is accessed and used
 - 9.2 Amount of fuel required is calculated
 - 9.3 Instructions are provided to ensure safety boundary for refuelling process is established
 - 9.4 Spill prevention systems are correctly deployed
 - 9.5 Instructions are provided to ensure refuelling operations are performed safely
 - 9.6 Notification of intention to refuel is made to authorities and other nearby operations

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.

Knots, hitches and bends must include:

- bowline
- clove hitch
- cod-end knot
- figure-eight knot
- half hitch
- reef knot
- rolling hitch
- round turn and two half hitches
- sheet bend
- timber hitch

Lifting gear includes one or more of the following:

- blocks (including chain blocks and power blocks)
- cargo handling wires, ropes and chains
- derricks and cranes
- drum ends and capstans
- eye bolts
- hooks
- ropes, slings and strops
- shackles
- swivels

Anchor and equipment includes one or more of the following:

- anchor buoy
- anchor securing arrangements
- anchor windlass
- sea anchor
- single anchor
- twin anchor
-

Coverage includes one or more of the following:

- accommodation spaces
- bow doors (barges)
- engine room
- galley
- storage spaces including freezer rooms
- wheelhouse

Secured includes one or more of the following:

- accommodation and storage spaces
- air pipes
- anchors
- doors
- galley, stores and equipment
- hatches
- large objects likely to move in a sea way
- materials on deck and below
- openings
- skylights
- tanks

Irregularities must include:

- affecting the safety and integrity of the:
 - vessel
 - crew and passengers
 - equipment
 - materials, such as cargo

Information must include:

- basic principles of stability
- impact of design and hull
- terms and definitions

Stability conditions must include:

- adding and removing weights
- additions or alterations to original configuration
- effects of slack tanks
- effects of water on deck
- hauling netting using power block
- roll period
- snagged trawl (hookup)
- stiff and tender vessel
- transferring weights using a crane or other lifting device

Tasks include one of the following:

- using portable ladders to access heights up to 1.8 metres
- working at heights more than 1.8 metres

Unit Mapping Information

This is a new unit. This unit is equivalent to MARN3001A Perform seamanship operations on board a vessel up to 24 metres.

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 MARN003 Perform seamanship operations on board a vessel up to 24 metres

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 on at least one occasion and include:

- anchoring vessel according to depth and prevailing winds
- checking seaworthiness of vessel
- completing basic stability calculations
- correctly coiling and stowing ropes
- correctly slinging loads ready for lifting
- correctly interpreting vessel stability data
- inspecting and maintaining harnesses, safety lines and other equipment for working aloft
- maintaining watertight integrity of vessel
- performing an eye splice and a short splice
- performing appropriate whippings on ropes and line
- preparing and throwing a heavy line
- recognising damaged or worn ropes, wires and chains
- recognising routine problems during lifting and rigging operations
- refuelling vessel with due regard to regulations and organisational procedures
- safely handling ropes and wires
- safely operating winches and windlasses
- safely working aloft or over the side
- securing vessel at its berth according to operational requirements and prevailing conditions
- selecting and using appropriate rigging and lifting gear
- tying figure-eight knot, reef knot, bowline and cod-end knot
- tying half hitch, clove hitch, round turn and two half hitches, rolling hitch and timber hitch
- using knots, hitches and securing arrangements.

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:

- anchoring principles and methods for different conditions
- basic structural parts of a small vessel

- being aware of own ability and limits to rectify irregularities
- communication techniques when operating lifting gear
- construction of vessel sufficient to understand which areas need to be made watertight
- correct application of common knots and hitches
- correct use and maintenance of equipment used for working aloft and over the side
- dangers of working with ropes under tension
- different types of anchors and where they can be most effectively used
- how to determine breaking strain and safe working load for ropes and equipment
- how to make vessel watertight
- maintenance of different types of rope, wire and chain
- methods of securing cargo including vehicles, stores and equipment on vessel before it puts to sea
- pollution regulations
- precautions to take when working aloft or over the side
- principles and limitations of lifting equipment and components
- principles of safe handling and transport of dangerous cargo
- procedures for checking and operating lifting equipment
- providing the required amount of detail in reports
- regulations affecting watertight integrity
- routine and emergency operation of anchors
- use of sea anchors
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARN004 Manage seaworthiness of a vessel up to 80 metres

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to manage vessel in a seaworthy condition for all stages of a voyage or operation being undertaken.

This unit applies to people working in the maritime industry 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

N – Seamanship

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 Supervise weather tight and watertight integrity of vessel

- 1.1 Principal structural components of vessel are identified from vessel drawings to understand the function of these components in relation to conventional vessel design
- 1.2 Pumping and pipeline systems of vessel are investigated to establish survivability of vessel in case of flooding and damage control
- 1.3 Procedures for maintaining weather tight and watertight

		integrity of vessel are interpreted and implemented according to vessel safety management plan and regulations
	1.4	Crew are instructed on requirements of plan and their responsibilities
	1.5	Actions are instigated to confirm weather tight and watertight integrity of vessel at all times
2	Take action to meet changed sea and weather conditions	
	2.1	Weather forecasts and observations of sea and weather conditions are used to predict situations that may jeopardise vessel weather tight and watertight integrity
	2.2	Effect of severe wind and rolling in associated sea conditions on vessel weather tight and watertight integrity is recognised
	2.3	Effect of water on deck on vessel weather tight and watertight integrity is ascertained
	2.4	Appropriate action is taken to maintain vessel weather tight and watertight integrity according to organisational procedures
3	Maintain records	
	3.1	Relevant documents and records are completed and maintained as required according to regulatory and organisational requirements
	3.2	Relevant documents are sent to appropriate bodies and copies are filed according to regulatory and organisational requirements
	3.3	Documents are stored according to regulatory and organisational requirements

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.

Structural components must include:	• design characteristics attributing to watertight integrity • principal components of vessel structure • structural arrangements to restrain fires • watertight and collision bulkheads
Actions include one or more of the following:	• closing openings • ensuring passenger distribution does not exceed allowed limits • ensuring stores, cargo and equipment are properly stowed and lashed • establishing procedures for restoring or managing weather tight and watertight integrity during an emergency • maintaining stability condition within approved limits • methods for testing tanks and other watertight openings
Relevant documents and records include one or more of the following:	• deck and official logbook entries • notes of protest • safety management plan

Unit Mapping Information

This is a new unit. This unit is equivalent to MARN4001A Manage seaworthiness of a vessel up to 80 metres.

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 MARN004 Manage seaworthiness of a vessel up to 80 metres

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 on at least one occasion and include:

- appropriately using bilge and other pumping arrangements
- assessing damage control measures
- completing required records
- maintaining weather tight and watertight integrity of vessel
- reading and interpreting vessel specifications, drawings and operational manuals.

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:

- bilge pumping arrangements
- different vessel types
- effects of adding and removing weights, water on deck, slack tanks, rolling period, stiff and tender vessel, additions or alterations to vessels
- principal parts of vessel and their various functions
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARN005 Maintain seaworthiness of a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to maintain the seaworthiness of a vessel.

This unit applies to people working in the maritime industry as a Watchkeeper Deck, a Master up to 500 gross tonnage (GT), or a Master up to 80 metres Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

N – Seamanship

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 Check weather tight and watertight integrity of vessel	<table border="0"><tr><td style="vertical-align: top;">1.1</td><td>Structural members of vessel are investigated to establish weather tight and watertight requirements of vessel</td></tr><tr><td style="vertical-align: top;">1.2</td><td>Inspections of vessel are planned according to regulatory and organisational requirements</td></tr><tr><td style="vertical-align: top;">1.3</td><td>Checks are completed to confirm weather tight and watertight integrity of vessel at all times</td></tr><tr><td style="vertical-align: top;">1.4</td><td>Defects and damage to vessel are identified and reported</td></tr></table>	1.1	Structural members of vessel are investigated to establish weather tight and watertight requirements of vessel	1.2	Inspections of vessel are planned according to regulatory and organisational requirements	1.3	Checks are completed to confirm weather tight and watertight integrity of vessel at all times	1.4	Defects and damage to vessel are identified and reported
1.1	Structural members of vessel are investigated to establish weather tight and watertight requirements of vessel								
1.2	Inspections of vessel are planned according to regulatory and organisational requirements								
1.3	Checks are completed to confirm weather tight and watertight integrity of vessel at all times								
1.4	Defects and damage to vessel are identified and reported								

- according to organisational procedures
- | | | |
|--|------------|--|
| 2 Take action to meet environmental changes | 2.1 | Anticipated sea and weather conditions are analysed to identify situations that may jeopardise vessel weather tight and watertight integrity |
| | 2.2 | Effect of severe wind and rolling in associated sea conditions on vessel weather tight and watertight integrity is recognised |
| | 2.3 | Effect of water on deck on vessel weather tight and watertight integrity is ascertained |
| | 2.4 | Appropriate action is taken to maintain vessel weather tight and watertight integrity according to organisational procedures |
| 3 Maintain records | 3.1 | Relevant documents and records are completed and maintained as required according to regulatory and organisational requirements |
| | 3.2 | Relevant documents are sent to appropriate bodies and copies are filed according to regulatory and organisational requirements |
| | 3.3 | Documents are stored according to regulatory and organisational requirements |

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.

Structural members of vessel include one or more of the following:	• bulkheads including the collision bulkhead • frames • freeboard deck • hatch and tank openings • longitudinal and transverse girders • shell plating • tank tops • various types of keel arrangements • watertight and weather tight compartments
Inspections of vessel includes one or more of the following:	• inspection of hull and fittings during dry-docking • inspections required after completion of maintenance work • inspections required after docking prior to refloating • inspections to be made after any situation which may have caused damage to the vessel • pre sailing inspections • routine inspections
Defects and damage include one or more of the following:	• corrosion to operating or structural parts of the vessel • damage to the vessel through cargo shift • hatch cover seals • structural damage through collision, grounding or fire • watertight door seals and closing arrangements
Situations that may jeopardise vessel weather tight and watertight integrity include one or more of the following:	• collision, grounding or fire • failure to conduct appropriate inspections • heavy weather damage
Appropriate actions include one or more of the following:	• avoiding adverse weather • checking the security of the vessel • closing openings • ensuring appropriate equipment is in readiness for damage control • ensuring free surface is minimised in ballast and fuel tanks • ensuring freeing ports allow water taken on deck to clear • ensuring passenger distribution does not exceed allowed limits • ensuring stores, cargo and equipment are properly stowed and

lashed

- establishing procedures for restoring or managing weather tight and watertight integrity during an emergency
- maintaining the stability condition within approved limits
- testing of tanks and other watertight areas

Relevant documents and records include one or more of the following:

- equipment manufacturer instructions
- logbooks, including oil record and garbage log books as applicable
- organisational operation orders under the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM) Code
- plans and drawings
- relevant maritime regulations and legislative requirements
- stability data manual

Unit Mapping Information

This is a new unit. This unit is equivalent to MARN5001A Maintain seaworthiness of a 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 MARN005 Maintain seaworthiness of a 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 on at least one occasion and include:

- completing required records
- reading and interpreting vessel specifications and drawings
- taking actions to ensure and maintain the weather tight and watertight integrity of vessel.

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:

- application of appropriate safety, environment and hazard control procedures
- characteristics of stress and the principal stresses acting on a vessel
- corrosion control methods
- damage control measures that may be required to maintain the integrity of the hull
- fundamental actions to be taken in the event of partial loss of intact buoyancy
- fundamentals of watertight integrity
- maintenance procedures contained in the safety management system
- one's surroundings and changes to these surroundings
- principal materials used in the construction of a vessel
- principal structured members and layout of a vessel and the proper names for various parts
- principles and procedures to ensure the watertight integrity of vessel hull
- procedures for checking and inspecting vessel seaworthiness
- stability, trim and stress tables, diagrams and stress calculating equipment
- 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.

Links

Companion Volume implementation guides are found in VETNet -

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

MARO001 Perform basic lookout duties

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to contribute to a safe lookout on a vessel up to 80 metres under instructions from the Master.

This unit applies to general purpose hands working in the maritime industry on vessels up to 80 metres. They could be working independently or as part a vessel crew.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

O – Watchkeeping

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 Follow instructions to monitor vessel situation when moored or anchored	<table border="0"><tr><td style="vertical-align: top;">1.1</td><td>Scheduled checks and inspections are conducted to comply with instructions</td></tr><tr><td style="vertical-align: top;">1.2</td><td>Appropriate action is taken in the event of irregularities or abnormal conditions to maximise the safety and integrity of the vessel</td></tr><tr><td style="vertical-align: top;">1.3</td><td>Restrictions on access to the vessel by visitors are followed according to instructions</td></tr></table>	1.1	Scheduled checks and inspections are conducted to comply with instructions	1.2	Appropriate action is taken in the event of irregularities or abnormal conditions to maximise the safety and integrity of the vessel	1.3	Restrictions on access to the vessel by visitors are followed according to instructions
1.1	Scheduled checks and inspections are conducted to comply with instructions						
1.2	Appropriate action is taken in the event of irregularities or abnormal conditions to maximise the safety and integrity of the vessel						
1.3	Restrictions on access to the vessel by visitors are followed according to instructions						

	1.4	VHF equipment is monitored and information is communicated to the Master as required
2 Follow instructions to monitor vessel situation when at sea	2.1	Proper lookout is maintained at all times according to instructions
	2.2	Lights, shapes and sound signals are correctly recognised
	2.3	Effective communication is maintained with the Master on matters relevant to the safety and integrity of the vessel
	2.4	VHF equipment is monitored and information is communicated to the Master as required
3 Respond to potential emergency situations	3.1	Emergency situations are promptly reported to the Master
	3.2	Distress signals are recognised and reported

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.

Scheduled checks and inspections must include:

- coverage
- frequency
- timing

Irregularities or abnormal conditions include one or

- events affecting the safety and integrity of:
- vessel

more of the following:

- crew
- equipment
- materials, such as cargo

Monitored includes one or more of the following:

- communications with other vessels
- communications with those on shore
- weather reports and warnings

Emergency situations include one or more of the following:

- cargo shift
- collision
- dragging anchor
- failure of vessel equipment and navigational lights
- fire
- fog or restricted visibility
- heavy weather
- loss of engine or propulsion controls
- loss of mooring lines
- loss of watertight integrity
- person overboard
- reception of distress signal
- stranding
- sudden list or loll
- synchronous rolling

Unit Mapping Information

This is a new unit. This unit is equivalent to MARO1001A Perform basic lookout duties.

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 MARO001 Perform basic lookout duties

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 on at least one occasion and include:

- communicating effectively with others on lookout issues and arrangements
- communicating required information in a timely manner
- correctly reporting other ships, objects, lights and navigation marks in relation to the ship's head
- identifying and reporting lights, buoys and sound signals
- monitoring and anticipating hazards and risks that may arise during lookout duties
- monitoring VHF equipment
- providing required amount of detail in reports
- responding to helm and engine orders given by the Master.

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:

- International Regulations for Preventing Collisions at Sea
- navigation lights, shapes and sound signals
- typical emergency situations and appropriate action and solutions.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARO002 Maintain a safe navigational watch

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to apply the accepted principles and procedures to be observed in maintaining a watch according to bridge resource management principles, to ensure a safe navigational watch on a vessel.

This unit applies to a Watchkeeper Deck, a Master up to 500 gross tonnage (GT), a Master up to 80 metres Near Coastal, or a Master Unlimited.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

O – Watchkeeping

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 Maintain watch on the bridge

- 1.1 Own responsibility for the safety of navigation is clearly defined at all times including periods when the Master is on the bridge and while under pilotage
- 1.2 Proper lookout is maintained at all times according to organisational procedures and regulatory requirements
- 1.3 Lights, shapes and sound signals are correctly recognised and

acted upon

- 1.4 Frequency and extent of monitoring traffic, vessel and environment are scheduled to conform with organisational procedures and regulatory requirements
 - 1.5 Bridge communication is maintained with other team members on matters relevant to the safety and integrity of the vessel
 - 1.6 Clear and unambiguous bridge communications are maintained and clarification is sought from or given to other team members when watch information or instructions are not clearly understood
 - 1.7 Internal and external communications systems are used according to organisational procedures
 - 1.8 Conduct, handover and relief of the watch is completed according to organisational procedures and regulatory requirements
- 2 Maintain watch when anchored**
- 2.1 Organisational procedures and regulatory requirements are complied with through frequency, timing and coverage of scheduled checks and inspections
 - 2.2 Appropriate action is taken in the event of irregularities or abnormal conditions to maximise the safety and integrity of the vessel
 - 2.3 Restrictions on access to the vessel by non-authorised persons are followed according to organisational procedures and regulatory requirements
 - 2.4 Internal and external communications systems are used according to organisational procedures
- 3 Respond to potential collision and emergency situations**
- 3.1 Potential collision situations are analysed and appropriate action is taken in ample time according to regulatory requirements
 - 3.2 Correct responses are made to emergencies and situations that pose a danger to the vessel and personnel on board
 - 3.3 Distress signals are recognised and appropriate action is taken to initiate search and rescue operations
 - 3.4 Master is called in the event of a navigational incident which falls outside own responsibility

4 Resource the bridge according to bridge resource management principles	4.1	Bridge resource management principles are interpreted to establish the functions and responsibilities of the watchkeeping team on board a vessel
	4.2	Resources are allocated and assigned as needed in correct priority to perform necessary tasks to obtain and maintain situational awareness
	4.3	Watchkeeping schedule is developed with due consideration to team experience
	4.4	Instructions on watchkeeping and lookout requirements are clearly and unambiguously given in relation to monitoring traffic, vessel and environment
	4.5	Clear and unambiguous roles and responsibilities of watchkeeping team are determined and allocated
	4.6	Effective communication is maintained with team on matters relevant to safety and integrity of vessel
	4.7	Questionable decisions and/or actions are dealt with using an appropriate challenge and response
5 Maintain navigation records	5.1	Proper record of the movements and activities related to the navigation of the vessel is maintained
	5.2	Records are 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.

- Lights, shapes and sound signals must include:
- alternative power source for lights
 - day time shapes for a vessel more than 500 gross tonnage
 - emergency lights for a vessel more than 500 gross tonnage
 - means of making sound signals for a vessel more than 500 gross tonnage
 - navigation lights for a vessel more than 500 gross tonnage

- Bridge communication includes one or more of the following:
- communication with engine room
 - verbal instruction relating to watchkeeping duties
 - written Master instructions

- Irregularities or abnormal conditions include one or more of the following:
- dragging anchor
 - fog and restricted visibility
 - heavy weather, including cyclones

- Emergencies include one or more of the following:
- person overboard
 - search and rescue operations

- Matters relevant to safety and integrity of vessel include one or more of the following:
- maintenance of proper lookout
 - navigation path and maintenance of vessels position
 - traffic density
 - visibility
 - weather and sea conditions

- Questionable decisions and/or actions include one or more of the following:
- excessive speed in heavy weather or reduced visibility
 - inappropriate action to avoid collision
 - incorrect helm orders

- Proper records include one or more of the following:
- course recorder
 - courses steered and vessel position
 - echo sounder recordings
 - logbook entries
 - passage plan

- radar logbook
- weather reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MAR5001A Maintain a safe navigational watch.

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 MARO002 Maintain a safe navigational watch

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 on at least one occasion and include:

- allocating and assigning resources as needed in correct priority to perform necessary tasks
- applying principles of bridge resource management
- appropriately challenging and responding to questionable decisions and/or actions
- clearly defining responsibility for the safety of navigation at all times
- communicating effectively with others on watchkeeping issues, arrangements and requirements
- conforming to accepted principles and procedures in the conduct, handover and relief of the watch
- correctly providing sound signals
- correctly recognising lights, shapes and sound signals
- giving and receiving clear and unambiguous communications
- identifying and solving problems that may arise during watchkeeping duties, reporting problems and issues and taking appropriate action based on available information
- identifying and implementing effective leadership behaviours
- interpreting and implementing procedures relevant to the role and responsibilities of watchkeeper
- maintaining a proper lookout at all times and in such a way as to conform to accepted principles and procedures
- maintaining a proper record of the movements and activities relating to the navigation of the vessel
- modifying activities dependent on differing vessel contingencies, risk situations and environments
- monitor and anticipate hazards and risks that may arise during watchkeeping duties and take appropriate action
- monitoring traffic, the ship and the environment to conform to accepted principles and procedures
- reporting according to the General Principles for Ship Reporting Systems and vessel traffic services (VTS) procedures
- selecting and using appropriate internal and external communications equipment during watchkeeping

- sharing an accurate understanding of current and predicted vessel state, navigation path and external environment with team members
- using information from navigational equipment to maintain a safe navigational watch
- using routeing according to the General Provisions on Ships' Routeing.

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:

- Australian Maritime Safety Authority (AMSA) watchkeeping procedures contained in Marine Orders
- blind pilotage techniques
- bridge instrumentation, controls and alarms relevant to the function of watchkeeping
- bridge procedures on board a vessel
- bridge resource management principles including allocation, assignment and prioritisation of resources; effective communication; assertiveness and leadership; obtaining and maintaining situational awareness; consideration of team experience
- causes of groundings, collisions and casualties
- content, application and intent of the International Regulations for Preventing Collisions at Sea
- fatigue management principles and techniques
- functions and responsibilities of the watchkeeping team on board a vessel
- International Association of Lighthouse Authorities (IALA) buoyage system A and B
- manual and electronic navigational aids available to the bridge team and procedures for their operation and use during a watch
- maritime communication techniques on board a vessel
- navigational hazards and implications for watchkeeping
- operating procedures for typical navigational aids
- precautions necessary when navigating in or near traffic separation schemes or other routeing measures
- principles and use of navigational recording devices for keeping records of the operation, behaviour and performance of the vessel and navigation equipment
- principles for the use of vessel routing and reporting systems for safe navigation
- principles to be observed in keeping a navigational watch
- procedures for the conduct, handover and relief of a watch
- procedures for the use of internal communications and alarm systems
- signs of fatigue
- typical bridge instrumentation, controls and alarms and their functions
- typical watchkeeping problems and emergency situations, and appropriate actions and solutions
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARO003 Transmit and receive information by the global maritime distress and safety system

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to transmit and receive information by global maritime distress and safety system (GMDSS) subsystems and equipment.

This unit applies to those in charge of or performing radio duties on a ship required to participate in the GMDSS.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

O – Watchkeeping

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 Operate GMDSS subsystems and equipment to send and receive messages

1.1	GMDSS communication equipment is operated to send and receive various types of signals according to manufacturer instructions, established GMDSS procedures and regulatory requirements
1.2	GMDSS procedures appropriate for the sea area concerned are correctly applied according to regulatory requirements

- 1.3 Regulations and procedures applicable to vessel stations equipped with GMDSS communication equipment and digital selective calling facilities are applied during radio communication
 - 1.4 Work health and safety (WHS)/occupational health and safety (OHS) procedures and hazard control strategies are applied when operating radio equipment according to vessel International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM) Code safety management system
- 2 Maintain radio equipment**
 - 2.1 Routine maintenance checks are conducted on GMDSS equipment according to manufacturer specifications and organisational procedures
 - 2.2 Out-of-specification performance and faults are investigated using fault finding techniques
 - 2.3 Identified faults and defective equipment and component parts are rectified or replaced according to manufacturer specifications and organisational procedures
- 3 Provide radio services during emergencies**
 - 3.1 Emergencies are correctly identified according to organisational procedures
 - 3.2 Organisational procedures are conformed with when taking initial action on becoming aware of an emergency or abnormal situation
 - 3.3 Communications are established with others using GMDSS communication equipment to facilitate the emergency response process
 - 3.4 Contact is maintained at all times with others to keep them briefed on the emergency response process
 - 3.5 Radio procedures as defined in the international and national radio regulations and safety of life at sea (SOLAS) convention are applied during the emergency
- 4 Maintain records**
 - 4.1 Records are completed and maintained as required according to regulatory and organisational requirements
 - 4.2 Relevant records are sent to appropriate bodies and copies are filed according to regulatory and organisational requirements
 - 4.3 Documents are stored according to regulatory and

organisational requirements

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.

- GMDSS communication equipment must include:
- antennas
 - batteries
 - digital selective calling (DSC) equipment
 - electrical and radio cable connections
 - electrical fuses
 - emergency position indicating radio beacon (EPIRB)
 - enhanced group calling (EGC) receiver
 - medium frequency/high frequency (MF/HF) equipment
 - navigational telex (NAVTEX) receiver
 - search and rescue transmitter (SART)
 - very high frequency (VHF) equipment

- Regulations must include:
- IMO STCW 95 Code concerning radio communication
 - Australian Maritime Safety Authority (AMSA) Marine Orders
 - SOLAS Convention
 - ITU Regulations

- Routine maintenance checks include one or
- battery level checks
 - equipment testing

more of the following:

Emergencies include one or more of the following:

- abandon ship
- assisting vessels in distress
- fire on board ship
- partial or full breakdown of radio installations
- rescuing persons from the water

Records include one or more of the following:

- radio communication log
- records of radio communication

Unit Mapping Information

This is a new unit. This unit is equivalent to MARO5002A Transmit and receive information by the Global Maritime Distress and Safety System.

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 MARO003 Transmit and receive information by the global maritime distress and safety system

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 on at least one occasion and include:

- applying work health and safety (WHS)/occupational health and safety (OHS) procedures when operating GMDSS subsystems and equipment
- communicating effectively with others when using GMDSS subsystems and equipment
- conducting operational checks on GMDSS subsystems and equipment
- keeping records of radio communications
- operating GMDSS subsystems and equipment according to manufacturer instructions
- reading and interpreting instructions for the use of GMDSS subsystems and equipment
- recognising typical faults with GMDSS subsystems and equipment, and taking appropriate action
- using the phonetic alphabet.

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:

- basic principles and features of marine radio communications including:
 - correct use of frequencies, frequency bands and modes of emission
 - frequencies for routine call and reply
 - distress, urgency and safety communication
 - definition of coverage and sea areas for digital selective calling (DSC)
 - radio calling, replying and relaying procedures
 - purpose of silence periods when operating radio equipment
 - limitations on the performance of different types of marine radio equipment
 - purpose for and procedures for the monitoring of calling and working frequencies
 - methods of communicating vessel position
- different types of marine radio equipment, their features, applications, operating characteristics and operating procedures
- hazards associated with radio transmission and the repair and maintenance of radio equipment and related hazard control measures

- international and national radio regulations applicable to mobile marine communication
- maintenance strategies and requirements for GMDSS equipment as defined in the International Convention for the Safety of Life at Sea (SOLAS) and Radio Regulations
- means to prevent the transmission of false distress alerts
- operational checks including checking radio performance; testing fuses; measuring capacity of batteries and the specific gravity of the electrolyte; measuring on and off load voltage
- principles of radio propagation including:
 - basic propagation mechanisms at LF, MF, HF and VHF
 - maximum user frequency (MUF)
 - optimum working frequency (OWF)
 - frequency bands
 - classes of emission
 - duplex, simplex paired frequencies and ITU channels
- procedures for:
 - keeping records of radio communication
 - transmitting and decoding the phonetic alphabet excluding the figure code
 - using various GMDSS systems and services including Inmarsat services (B, C, M and E); enhanced group calling system (EGC); DSC facilities and usage; EGC receiver; maritime safety information (MSI) services; navigational telex (NAVTEX) system; SafetyNET system
- prohibitions on connecting non-GMDSS equipment
- radio communication problems and appropriate actions and solutions
- radio equipment faults, defects and related fault finding techniques
- requirements of ship reporting systems
- types, applications and features of basic antenna systems used in marine radio communications
- use of radio medical services.

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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARO004 Transmit and receive information by visual signalling

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to transmit and receive information by visual signalling.

This unit applies to a Watchkeeper Deck, a Master up to 500 gross tonnage (GT), a Master up to 80 metres Near Coastal, or a Master Unlimited.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

O – Watchkeeping

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 Use code to send and receive messages by flashing light

1.1	Codes for letters and numerals are correctly recognised
1.2	Message is correctly coded and sent using a flashing light
1.3	Message transmitted in code by flashing light is correctly decoded

2 Use International Code of Signals to

2.1	Flags used in the International Code of Signals are correctly recognised

send and receive messages with flags	2.2	Message is correctly coded and sent with flags using the International Code of Signals
	2.3	Message coded and sent with flags using the International Code of Signals is correctly decoded
3 Maintain records of visual communications	3.1	Records of messages sent and received are completed and maintained as required according to regulatory and organisational requirements
	3.2	Relevant records are sent to appropriate bodies if requested and copies are filed according to regulatory and organisational requirements
	3.3	Documents are stored according to regulatory and organisational requirements

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.

Codes must include:

- Morse Code
- single letter and numeral international code flags

Messages include one or more of the following:

- distress signal SOS
- medical advice
- single letter flag signal codes

Flashing lights include one or more of the following:

- fixed mast installation
- mirrors
- Morse signalling lamp

Unit Mapping Information

This is a new unit. This unit is equivalent to MARO5003A Transmit and receive information by visual signalling.

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 MARO004 Transmit and receive information by visual signalling

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 on at least one occasion and include:

- communicating effectively with others, including the Master, when transmitting and receiving information by visual signalling
- keeping records of visual signalling communications
- reading and interpreting maritime regulations relating to visual signalling
- transmitting and receiving by Morse light, distress signal SOS as specified in Annex IV International Regulations for the Prevention of Collisions at Sea and Appendix 1 of the International Code of Signals
- transmitting and receiving messages using flags according to the International Code of Signals
- using the International Code of Signals.

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:

- International Code of Signals
- Australian Maritime Safety Authority (AMSA)
- procedures for sending visual messages with flags using the International Code of Signals
- procedures for using a flashing light to send messages using Morse Code
- visual signalling of single-letter signals as specified in the International Code of Signals
- 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.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MAR Maritime Training Package

Modification History

The version details of this endorsed Training Package are in the table below.

Version number	Release date	Comment
1.1	3 December 2013	ISC Upgrade. Amendments to the following units: • MARA005 Maintain vessel stability • MARC008 Manage fuel systems • MARC009 Operate and monitor marine internal combustion engines, propulsion plant and auxiliary systems • MARC010 Operate electrical systems • MARC011 Manage a propulsion unit using appropriate engine systems and support services • MARC018 Employ tools, equipment and materials in a shipboard context
1	7 October 2013	Primary release. The MAR Maritime Training Package is the result of the near coastal material in the MAR13 Maritime Training Package being transitioned to the new <i>Standards for Training Packages</i> . The remaining material in the MAR13 Maritime Training Package will be transitioned to the MAR Maritime Training Package over time.

Credit Arrangements

At the time of endorsement of this Training Package no national credit arrangements exist.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

MARSS00004 Marine Emergency Care, Craft and Communication Skill Set

Modification History

Release 1. New Skill Set.

Description

This Skill Set reflects the additional units required by people certified as a Master up to 80 metres Near Coastal seeking Australian Maritime Safety Authority (AMSA) certification as a Master up to 500 GT as defined by the National Standard for Commercial Vessels (NSCV) Part D.

Pathways Information

The MAR Marine Emergency Care, Craft and Communication Skill Set is part of the MAR Maritime Training Package.

Before undertaking this Skill Set, candidates seeking certification as a Master up to 500GT should check with AMSA to determine additional certification requirements.

Licensing/Regulatory Information

Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Skill Set Requirements

MARF007	Operate survival craft and other lifesaving appliances
MARF015	Manage provision of medical care on board a vessel
MARO003	Transmit and receive information by the global maritime distress and safety system

Target Group

People who hold a MAR50713 Diploma of Maritime Operations (Master up to 80 metres Near Coastal), have AMSA certification to work as a Master up to 80 metres Near Coastal as defined by NSCV Part D and are seeking certification as a Master up to 500 GT.

Suggested words for Statement of Attainment

The MAR Marine Emergency Care, Craft and Communication Skill Set reflects additional responsibilities undertaken by someone with AMSA certification as a Master up to 80 metres Near Coastal seeking certification as a Master up to 500 GT.

Custom Content Section

Not applicable.

MARSS00005 Marine Engineering Class 3 Near Coastal Maintenance Skill Set

Modification History

Release 1. New Skill Set.

Description

This Skill Set reflects additional maintenance responsibilities for people who are an Engineer Class 3 Near Coastal.

Pathways Information

The MAR Marine Engineering Class 3 Near Coastal Maintenance Skill Set is part of the MAR Maritime Training Package.

This Skill Set meets the workshop skill equivalent or trade requirement for entry to progress from the MAR50613 Diploma of Maritime Operations (Marine Engineering Class 3 Near Coastal) to the MAR50213 Diploma of Maritime Operations (Engineer Watchkeeper).

Before undertaking this Skill Set, candidates seeking certification should check with AMSA to determine additional certification requirements.

Licensing/Regulatory Information

Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Skill Set Requirements

MARB013	Maintain and repair marine electrical and electronic equipment
MARB014	Maintain and repair shipboard machinery and equipment
MARC018	Employ tools, equipment and materials in a shipboard context

Target Group

People who hold a MAR50613 Diploma of Maritime Operations (Marine Engineering Class 3 Near Coastal), have Australian Maritime Safety Authority (AMSA) certification to work on a vessel with propulsion power of less than 3000 kW in the exclusive economic zone (EEZ), are required to undertake additional maintenance and trade skill responsibilities, and who wish to progress to the MAR50213 Diploma of Maritime Operations (Engineer Watchkeeper).

Suggested words for Statement of Attainment

The MAR Marine Engineering Class 3 Near Coastal Maintenance Skill Set reflects additional maintenance and trade skill responsibilities undertaken by someone with AMSA certification as a Marine Engineer Class 3 Near Coastal.

Custom Content Section

Not applicable.

MARSS00006 Marine Engineering Class 3 Near Coastal Shipboard Safety Skill Set

Modification History

Release 1. New Skill Set.

Description

This Skill Set reflects the additional units required by people certified as an Engineer Class 3 Near Coastal seeking Australian Maritime Safety Authority (AMSA) certification as an Engineer Watchkeeper or who are required by AMSA to perform additional shipboard safety responsibilities.

Pathways Information

The MAR Marine Engineering Class 3 Near Coastal Shipboard Safety Skill Set is part of the MAR Maritime Training Package.

Before undertaking this Skill Set, candidates seeking certification as an Engineer Watchkeeper should check with AMSA to determine additional certification requirements.

Licensing/Regulatory Information

Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Skill Set Requirements

MARF007	Operate survival craft and other lifesaving appliances
MARF011	Manage firefighting and fire prevention activities on board a vessel
MARF013	Provide medical first aid on board a vessel

Target Group

People who hold a MAR50613 Diploma of Maritime Operations (Marine Engineering Class 3 Near Coastal), have Australian Maritime Safety Authority (AMSA) certification to work on a vessel with propulsion power of less than 3000 kW in the exclusive economic zone (EEZ), are required to undertake additional shipboard safety responsibilities and who may wish to progress to the MAR50213 Diploma of Maritime Operations (Engineer Watchkeeping).

Suggested words for Statement of Attainment

The MAR Marine Engineering Class 3 Near Coastal Shipboard Safety Skill Set reflects additional shipboard safety responsibilities undertaken by someone with AMSA certification as a Marine Engineer Class 3 Near Coastal.

Custom Content Section

Not applicable.

MARSS00007 Safety Training Certification Skill Set

Modification History

Release 1. New Skill Set.

The MARSS00007 Safety Training Certification Skill Set is equivalent to the MARSS00002 Safety Training Certification Skill Set.

Description

This Skill Set reflects the work required by people who need an Australian Maritime Safety Authority (AMSA) Certificate of Safety Training.

Pathways Information

The MAR Safety Training Certification Skill Set is part of the MAR Maritime Training Package.

Licensing/Regulatory Information

Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Skill Set Requirements

MARF003	Follow vessel security procedures
MARF006	Observe personal safety and social responsibility
MARF008	Prevent and fight fires on board a vessel
MARF009	Survive at sea in the event of vessel abandonment

Target Group

People interested in the Australian Maritime Safety Authority (AMSA) Certificate of Safety Training.

Suggested words for Statement of Attainment

The MAR Safety Training Certification Skill Set is from the MAR Maritime Training Package and meets some of the industry requirements for the AMSA Certificate of Safety Training; people seeking certification should check with AMSA.

Custom Content Section

Not applicable.

MARSS00008 Shipboard Safety Skill Set

Modification History

Release 1. New Skill Set.

The MARSS00008 Shipboard Safety Skill Set is equivalent to the MARSS00003 Shipboard Safety Skill Set.

Description

This Skill Set reflects the work required by people who need an Australian Maritime Safety Authority (AMSA) Elements of Shipboard Safety Certificate.

Pathways Information

The MAR Shipboard Safety Skill Set is part of the MAR Maritime Training Package.

Licensing/Regulatory Information

Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Skill Set Requirements

MARF001	Apply basic survival skills in the event of vessel abandonment
MARF002	Follow procedures to minimise and fight fires on board a vessel
MARF004	Meet work health and safety requirements
MARF005	Survive at sea using survival craft

Target Group

People interested in the AMSA Elements of Shipboard Safety Certificate.

Suggested words for Statement of Attainment

The MAR Shipboard Safety Skill Set is from the MAR Maritime Training Package and meets some of the industry requirements for the AMSA Elements of Shipboard Safety Certificate; people seeking certification should check with AMSA.

Custom Content Section

Not applicable.