



Australian Government

MARH021 Manage the navigation of a vessel

Release: 1

MARH021 Manage the navigation of a vessel

Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package.

Application

This unit involves the skills and knowledge required to manage the planning of a voyage and the navigation of a vessel, determine position and accuracy of resultant of position fix by any means, determine and allow for compass errors, and establish watchkeeping arrangements and procedures.

This unit applies to people working in the maritime industry in the capacity of:

- Master of a commercial vessel Unlimited.

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit.

- This unit is one of the requirements to obtain Australian Maritime Safety Authority (AMSA) certification as a Master Unlimited and to meet regulatory requirements this unit must be delivered consistent with Marine Orders and with the relevant sections of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).
- Those regulatory requirements include STCW International Maritime Organization (IMO) model course competencies and areas of knowledge, understanding and proficiency, together with the estimated total hours required for lectures and practical exercises. Teaching staff should note that timings are suggestions only and should be adapted to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

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

1	Oversee development of passage plan	1.1	Requirements of passage are established
		1.2	Reasons for planned route are supported by facts and statistical data obtained from relevant sources and publications
		1.3	Positions, courses, distances and time calculations are checked for correctness within accepted accuracy standards for navigational equipment
		1.4	Potential navigational hazards are accurately identified
2	Develop and implement watchkeeping arrangements and procedures	2.1	Watchkeeping arrangements and procedures are developed according to bridge resource management principles, and organisational and regulatory requirements
		2.2	Bridge resource management principles are appropriately applied in establishing watchkeeping arrangements and procedures and in developing an effective bridge working system
		2.3	Communications strategies are developed to link watchkeeping procedures with all aspects of vessel operations
		2.4	Fatigue management strategies are developed according to organisational and regulatory requirements
		2.5	Corrective action procedures are developed and monitored
		2.6	Procedures for reporting, recording and responding to emergencies and non-compliance are established
3	Monitor bridge team in implementing passage	3.1	Work schedule for bridge team is detailed according to

plan		bridge resource management principles
	3.2	Risk control measures are evaluated against passage plan
	3.3	Navigation requirements are communicated to bridge team
	3.4	Individuals are fully briefed and responsibilities are coordinated
	3.5	Navigation tasks are carried out according to passage plan
	3.6	Ongoing checks and position determination are conducted according to organisational procedures
	3.7	Non-routine problems related to navigation of vessel are solved
	3.8	Navigational data is signed off according to organisational procedures
	3.9	Work schedule for bridge team is detailed according to bridge resource management principles
4 Interpret and evaluate information from electronic navigational system	4.1	Data from radar plotting sheet is interpreted and analysed to anticipate potential collisions
	4.2	Data produced by other electronic navigational aids is interpreted and used to assist navigational command decisions, taking into account known limitations and errors associated with each type of aid
	4.3	Information obtained through a single vessel or multiple vessel analysis of radar plots or other electronic navigational data is used to make command decisions on action needed to avoid collisions
	4.4	Radar data is used to obtain position fix for vessel using electronic bearing lines and variable range markers
5 Navigate in complex situations	5.1	Measurements and observations of sea and weather conditions are used to determine vessel speed and direction in complex situations
	5.2	Information from bridge equipment is interpreted to identify navigational hazards and to fix vessel position

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| | 5.3 | Nautical publications on tides and currents are used to calculate tidal conditions |
| | 5.4 | Alterations to vessel course or speed are made to meet prevailing circumstances and changing conditions |
| | 5.5 | Navigational manoeuvres are conducted within safe operational limits of vessel |
| | 5.6 | Details of passage are recorded in vessel log according to regulations |
| | 5.7 | Variations to planned route are documented prior to archiving, on completion of voyage |
| 6 | Manage emergencies | |
| | 6.1 | Bridge team is taken charge of when called to bridge in response to an emergency |
| | 6.2 | Safety management system (SMS) procedures are implemented when taking over bridge watch from officer of the watch |
| | 6.3 | Appropriate action is taken to initiate search and rescue (SAR) procedures on receipt of distress signal |
| | 6.4 | Advice is provided to watchkeeper regarding response to emergency situations |
| 7 | Maintain navigational equipment | |
| | 7.1 | Navigational charts, nautical publications and related documentation are stored and maintained according to organisational procedures |
| | 7.2 | Inventory of navigational charts, nautical publications and related documentation is established and kept according to organisational procedures |
| | 7.3 | Navigational charts, nautical publications and related documentation are ordered and updated from relevant sources to ensure available data needed for voyage planning is current |
| | 7.4 | Performance checks and tests of navigation position fixing instruments and systems are carried out according to organisational procedures and manufacturer instructions |
| 8 | Prepare reports and documentation relevant to passage | |
| | 8.1 | Passage information is recorded and reported in required format, style, structure and timeframe |

- 8.2** All information is recorded and reported according to legislative requirements
- 8.3** Technology is used to store and retrieve information

Foundation Skills

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

Range of Conditions

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

Unit Mapping Information

This unit replaces and is equivalent to MARH012 Manage the navigation of a vessel 500 gross tonnage or more.

Links

Companion Volume implementation guide can be found in VetNet -

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

Assessment Requirements for MARH021 Manage the navigation of a vessel

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices
- assessing accuracy of fix properly
- calculating positions, courses, distances and time correctly within accepted accuracy standards for navigational equipment
- calculating tidal conditions to determine under keel clearances and air drafts
- choosing the most appropriate primary method for fixing vessel position given the prevailing circumstances and conditions
- conducting performance checks of navigation position fixing instruments and systems
- determining and allowing for errors of magnetic and gyrocompass
- determining position in all conditions by celestial observations and terrestrial observations, and using modern navigational aids within accepted accuracy levels
- ensuring currency of relevant legislative and regulatory knowledge
- ensuring currency of relevant reference material
- enumerating the equipment, charts and nautical publications required for the voyage and appropriate to the safe conduct of the voyage
- establishing and maintaining watchkeeping arrangements in compliance with international regulations and guidelines so as to ensure the safety of navigation, protection of the marine environment, and the safety of the vessel and persons onboard
- identifying all potential navigational hazards accurately
- planning, navigating and monitoring a voyage for all conditions, including:
 - areas of extensive tidal effects
 - ice
 - meteorological conditions
 - restricted visibility
 - restricted waters
 - traffic separation schemes
 - vessel traffic service (VTS) areas
- recognising faulty equipment and readings, and taking appropriate action
- recognising problems that may be experienced when planning and navigating a passage, and

taking appropriate action

- reporting according to General Principles for Ship Reporting Systems and VTS procedures
- supporting reasons for planned route using facts and statistical data obtained from relevant sources and publications
- undertaking routeing according to the General Provisions on Ships' Routeing
- using chart catalogues, charts, nautical publications and vessel particulars to plan and navigate a passage.

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) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) including the Manila Amendments
- bridge watchkeeping equipment and systems, including:
 - Bridge Navigational Watch Alarm Systems (BNWAS)
 - voyage data and simplified data recorder
- content, application and intent of bridge resource management principles to be observed in keeping a navigational watch
- content, application and intent of the International Regulations for Preventing Collisions at Sea (COLREGs)
- emergencies, including:
 - engine failure
 - failure of navigational equipment
 - potential close quarter situations
- General Principles for Ship Reporting Systems
- General Provisions on Ships' Routeing
- heightened risk situations, including:
 - adverse weather
 - areas of extensive tidal effects
 - ice
 - restricted visibility
 - restricted waters
 - traffic separation schemes
 - VTS areas
- integrated bridge systems
- logbooks and voyage records
- method and frequency of checks for errors of magnetic and gyrocompasses to ensure accuracy of information
- methods for fixing position of a vessel
- modern electronic navigational aids, their operating principles, limitations, sources of error,

detection of misrepresentation of information and methods of correction to obtain accurate position fixing

- non-routine problems, including:
 - equipment failure
 - extreme weather conditions that would impact a vessels position
 - potential collision and emergency situations
 - steaming in company
- operation and care of the main types of gyrocompass
- position determination, including:
 - azimuth mirrors
 - chronometer
 - doppler and electronic logs
 - echo sounders
 - electronic chart system (ECS) and electronic chart display and information system (ECDIS)
 - integrated navigation systems
 - magnetic and gyrocompasses and repeaters
 - radar and other electronic navigation devices
- principles of magnetic and gyrocompasses
- problems experienced when fixing vessel position and appropriate action and solutions
- procedures for filing and maintaining navigational charts, nautical publications and related documentation in serviceable condition
- procedures for swinging a vessel to determine deviation
- relevant AMSA Marine Orders
- requirements for effective passage planning, including contingency planning
- systems under control of the master gyro
- vessel reporting systems and their use in planning and conducting a voyage
- voyage planning and navigation for all conditions by acceptable methods of plotting ocean tracks
- VTS procedures
- watchkeeping arrangements include:
 - clear instruction to watchkeeping officers in the Standing Orders from the Master
 - establishing a proper lookout separate from the helmsman
 - fatigue management strategies
 - watch handover procedures
- WHS/OHS requirements and work practices.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

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.

Practical assessment must occur in a workplace, or realistic simulated workplace, under the normal range of workplace conditions.

Simulations and scenarios may be used where situations cannot be provided in the workplace or may occur only rarely, in particular for situations relating to emergency procedures and adverse weather conditions where assessment would be unsafe, impractical or may lead to environmental damage.

Resources for assessment must include access to:

- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures and operational manuals, including:
 - annual and weekly notices to mariners
 - nautical almanac
 - radio signals, light lists, sailing directions, tide tables and chart catalogues
 - ship reporting systems and requirements
 - ship's routeing information
 - SMS procedures
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE) currently used in industry.

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