



Australian Government

MARH010 Use bridge equipment to determine vessel position

Release: 1

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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

Navigation 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.

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