



Australian Government

MARH022 Plan and conduct a passage and determine position

Release: 2

MARH022 Plan and conduct a passage and determine position

Modification History

Release 2. This is the second release of this unit of competency in the MAR Maritime Training Package.

- Minor statement changes in unit Application
- Minor statement re-order in Performance Evidence.

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package Release 6.0.

Application

This unit involves the skills and knowledge required to plan and conduct a passage, determine position on a vessel using a range of bridge equipment, and evaluate meteorological information for passage planning.

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

- Master up to 100 metres Near Coastal
- Master up to 500 gross tonnage (GT)
- Watchkeeper Deck.

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit.

- 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.

Near Coastal Qualifications:

- This unit is one of the requirements to obtain Australian Maritime Safety Authority (AMSA) certification as a Master up to 100 metres Near Coastal as specified in Marine Order 505.

Blue Waters Qualifications:

- This unit is one of the requirements to obtain AMSA certification as a Master of a commercial vessel up to 500 gross tonnage (GT) or Watchkeeper Deck 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).

Training providers seeking to offer this unit of competency must gain AMSA approval before the unit is offered.

Seafarers seeking certification should check with AMSA.

Pre-requisite Unit

Not applicable.

Competency Field

H – Navigation

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Plan passage

PERFORMANCE CRITERIA

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

- 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

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| | 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 |

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| 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

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 MARH008 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 MARH022 Plan and conduct a passage and determine position

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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:

- adjusting steering controls for optimum performance
- calculating courses using plane, Mercator and great circle sailing (GCS) 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
- determining errors in magnetic and gyrocompasses, and correctly applying to courses and bearings
- determining errors of magnetic and gyrocompasses using celestial and terrestrial means, and allowing for such errors
- determining vessel position by use of:
 - aids to navigation, including lighthouses, beacons and buoys
 - dead reckoning (DR), taking into account winds, tides, currents and estimated speed
 - electronic navigational aids
 - landmarks
 - rising and dipping distances of lights and the use of horizontal angles
- determining vessel position within the limits of acceptable instrument/system errors
- estimating position using DR
- interpreting and applying meteorological information correctly
- interpreting nautical charts and publications, including symbols and other chart information
- maintaining charts and publications by applying up-to-date corrections to both paper and electronic charts and publications
- measuring and observing weather conditions accurately
- operating echo-sounders and applying the information correctly
- preparing calculations and measurements of navigational information accurately
- producing accurate and reliable information

- reading the aneroid barometer and interpreting the information obtained
- selecting and applying primary position fixing method, including:
 - celestial observations
 - radar ranges or bearings
 - radio navigation aids
 - running fix
 - simultaneous bearings or transits of coastal features
 - soundings to determine position
 - terrestrial observations
- selecting mode of steering most suitable for prevailing weather, sea and traffic conditions and intended manoeuvres, including:
 - automatic pilot
 - electric systems
 - hydraulic systems
- using and interpreting information obtained from shipborne meteorological instruments
- using celestial bodies to determine vessel position
- using navigational charts, nautical publications and related documentation, including:
 - Nautical Almanac
 - nautical tables
 - Notices to Mariners
 - paper charts
 - radio navigational warnings
 - sailing directions
 - temporary warning notices
 - tide tables
 - vessel routing information
 - weather reports and warnings.

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:

- celestial observations and calculations, including:
 - celestial sphere and equinoctial system of co-ordinates
 - compass error using azimuth and amplitude
 - daily motion and horizontal system of co-ordinates
 - hour angle
 - latitude by meridian altitude
 - pole star observations
 - sextant and altitude corrections

- solar system
- time and equation of time
- 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
- effects of current and leeway on the course and speed of the vessel (without calculations)
- finding the variation from the chart
- fixing vessel position by:
 - radar ranges and bearings
 - simultaneous bearings, transits of coastal features, and running fix
- hazards, including:
 - restricted visibility
 - shallow water
 - traffic
 - unlit beacons
- interpreting the set and drift of the current from information available on the chart
- maintaining information in a navigational log and voyage records
- measuring distance on a chart
- meteorological instruments and their use
- meteorological terms
- nautical charts and publications
- navigation systems, performance checks and tests to comply with manufacturers' recommendations and good navigation practice
- plane, Mercator and GCS concepts and calculations
- principles of magnetic and gyrocompasses and fluxgate compass
- 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, including operating procedures
- theory of tides
- times and heights of high and low water from Australian or local tide tables for primary and secondary ports and the relevance of chart datum
- use and limitations on the use of electronic position fixing equipment, including:
 - augmented satellite systems
 - enhance loran-C system
 - global navigation satellite system (GNSS) and Galileo
 - global navigation system (GNS) and global positioning system (GPS)
 - loran-C system
- use of a deviation card

- using a single position line to assist in clearing dangers
- using modern electronic navigational aids to determine vessel position
- using meteorological information available, including:
 - atmospheric pressure
 - cloud precipitation
 - recording and reporting weather observations
 - structure of depressions
 - tropical revolving storms and other pressure systems
 - visibility
 - weather services for shipping
 - wind and other pressure systems over the ocean
- 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 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, an Australian Maritime Safety Authority (AMSA)-approved simulator or 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
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE) currently used in industry.

Links

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