



Australian Government

MARN012 Manage advanced operations of ships in polar waters

Release: 1

MARN012 Manage advanced operations of ships in polar waters

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 advanced operations of ships in polar waters.

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

- Chief Mate
- Deck Officers
- Engineering Officers
- Engineers
- Masters
- Ratings.

Licensing/Regulatory Information

This unit is equivalent to and delivers the objectives of the following STCW provisions:

- STCW Reg V/4 (3 and 4) and Code Section A-V/4, Table A-V/4-2.

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 Masters, Chief Mate, Deck Officers, Engineering Officers, Engineers or Ratings for advanced operations in polar waters 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

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.

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|---|--|
| 1 Plan and conduct a polar passage | 1.1 Navigational equipment, charts, ice information, ice publications and related documentation required for the voyage are enumerated and appropriate for the safe conduct of the voyage |
| | 1.2 Route is planned using facts obtained from relevant sources, publications, statistical data, limitations of communication and navigational systems |
| | 1.3 Voyage is planned using polar regulatory regimes, need for ice pilotage and icebreaker assistance, as required |
| | 1.4 Potential navigational hazards are identified accurately at all times |
| | 1.5 Positions, courses, distances and time calculations are accurate and correct within acceptable accuracy standards for navigational equipment |
| 2 Manage operation of vessels operating in polar waters safely | 2.1 Navigational decisions concerning ice are based on proper assessments of the ship's manoeuvring, engine characteristics and the forces to be expected while navigating polar waters, at all times |
| | 2.2 Requests for ice routing, plot and commence voyage through ice is communicated clearly and accurately |
| | 2.3 Decisions concerning berthing, anchoring, cargo and ballast operations are determined using an assessment of the ship's manoeuvring, engine characteristics, forces to be expected and in accordance with International Code for Ships Operating in Polar Waters (Polar Code) |

- guidelines and applicable international agreements
- 2.4 Ship is manoeuvred safely through moderate ice concentration in the range of 1/10 to 5/10
 - 2.5 Ship is manoeuvred safely through dense ice concentration in the range of 6/10 to 10/10
 - 2.6 Operations are planned and carried out in accordance with established rules and procedures to ensure safe operations and avoid pollution of the marine environment
 - 2.7 Safe navigation is maintained using strategy, adjustment of ship's speed and heading through different types of ice
 - 2.8 Anchoring system in cold temperatures is permitted, where appropriate, and actions taken accordingly
 - 2.9 Preparation for icebreaker towing and notch towing are carried out in accordance with accepted principles and practices
- 3 Maintain safety of ship's crew and passengers**
- 3.1 Lifesaving, firefighting and other safety systems are maintained at their operational condition
 - 3.2 Response measures are in accordance with established plans and procedures and are appropriate to the situation and nature of the emergency

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 is a new unit. No equivalent unit.

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 MARN012 Manage advanced operations of ships in polar waters

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 two occasions and include:

- communicating with icebreaker, other vessels in the area and with rescue coordination centres, where applicable
- determining limitations of navigational equipment and communication systems in polar waters
- establishing bridge watch team which is consistent with environmental conditions and vessel equipment and ice class
- evaluating limitations and determining the extent to which information is suitable for safe navigation and identifying navigational solutions in hazard conditions
- identifying presentations of various ice conditions as they appear on radar
- interpreting visuals of ice conditions as they appear on radar
- measuring and observing environmental conditions
- modifying and deviating voyage plan for dynamic ice conditions
- manoeuvring of a vessel through ice, including:
 - manoeuvring a vessel through moderate ice concentration (range of 1/10 to 5/10)
 - manoeuvring a vessel through dense ice concentration (range of 6/10 to 10/10)
- preparing and conducting risk assessment before approaching ice
- using and interpreting information from navigational equipment, nautical charts, nautical publications and related documentation
- using icebreaker terminology and communication, where applicable.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of elements and performance criteria and include knowledge of:

- effects of handling ship in various ice concentration and coverage including risks associated with navigation in ice, including:
 - avoid turning and backing simultaneously
- equipment limitations, including:
 - communication systems

- discrimination of radar targets and ice features in ice clutter
- electronic positioning systems at high latitude
- hazards associated with limited terrestrial navigational aids in polar regions
- high latitude errors on compasses
- nautical charts and pilot descriptions
- national, international and regional standards, including:
 - International Convention for the Safety of Life at Sea (SOLAS)
 - International Code for Ships Operating in Polar Waters (Polar Code)
 - International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)
 - International Convention for the Prevention of Pollution from Ships (MARPOL)
 - International Maritime Organization (IMO) standards for operation in remote areas
 - International Code of Signals
- operate and manoeuvre a ship in ice, including:
 - anchoring in ice, including:
 - dangers to anchoring system
 - ice accretion to hawse pipe and ground tackle
 - communications including:
 - icebreaker communication
 - communication with other vessels in the area
 - communication with Rescue Coordination Centres
 - conditions for safe entry and exit to and from ice and open water, including:
 - avoiding icebergs
 - cracks
 - dangerous ice conditions
 - leads
 - maintaining safe distance to icebergs
 - conditions which impact polar visibility and give indications of:
 - ice blink
 - local ice
 - refraction
 - sea smoke
 - water conditions
 - water sky
 - need for bridge watch team augmentation based on:
 - environmental conditions
 - vessel equipment
 - vessel ice class
 - icebreaker convoy terminology, including:
 - convoy communications

- icebreaker direction
- moving in convoy
- ice ramming procedures, including double and single ramming passage
- methods to avoid besetment, free best vessel and consequences of besetment
- preparation and risk assessment before approaching ice and icebergs and conditions, including:
 - darkness
 - fog
 - pressure ice
 - swell
 - wind
- presentations of various ice conditions as they appear on radar
- towing and rescue in ice, including risks associated with operation
- use of different type of propulsion and rudder systems, including:
 - avoiding damage when operating in ice
 - limitations in ice
- use of heeling and trim systems, including hazards associated with operation and various techniques to safely dock and undock in ice covered waters
- publications and manuals, including:
 - Polar Water Operations Manual (PWOM)
 - shipboard documentation
- ship crew and passenger safety, including:
 - limitations of firefighting systems and lifesaving applications due to low air temperatures
 - procedures and techniques for abandoning the ship and survival on ice and in ice covered waters
 - unique concerns when conducting emergency drills in ice and low temperatures
 - unique concerns when conducting emergency response in ice and low air and water temperatures
- voyage planning and reporting, including:
 - development of safe routeing and passage planning to avoid ice where possible
 - evaluating information to determine if it is suitable for safe navigation
 - information sources
 - limitations of hydrographic information and charts in polar regions
 - passage planning deviation and modification for dynamic ice conditions
 - reporting regimes in polar waters.

Assessment Conditions

Assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include

requirements in the Standards for Registered Training Organisations current at the time of assessment.

Training and assessment must meet Australian Maritime Safety Authority (AMSA) regulatory requirements which are mandated in sections of International Maritime Organization (IMO) model courses for AMSA accreditation.

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
- tools, equipment, machinery, materials and personal protective equipment (PPE) currently used in industry.

Links

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