



Australian Government

MARH026 Apply knowledge of dynamic positioning operations

Release: 1

MARH026 Apply knowledge of dynamic positioning operations

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 apply knowledge of the operations of dynamic positioning, including its uses and applications.

This unit includes explaining routine dynamic positioning operations, applying position reference handling principles and emergency dynamic positioning operations principles.

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

- Dynamic Positioning Operator.

Work is performed under limited supervision and applies to those responsible for operating dynamic positioning control systems in the work environment and who are responsible for their own work.

Before undertaking this unit, seafarers will need to hold or be working towards the achievement of one of the following:

- Chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more
- Chief engineer officers and second engineer officers on ships powered by main propulsion machinery of between 750 kW and 3,000 kW propulsion power
- Electro-technical officer
- Master or chief mate on ships of 3,000 Gross Tonnage (GT) or more
- Officers in charge of a navigation watch on ships of 500 GT or more
- Officers in charge of a navigational watch and Masters on ships of less than 500 GT
- Officers in charge of an engineering watch in a manned engine room or designated duty engineers in a periodically unmanned engine room.

Licensing/Regulatory Information

There are no legislative and regulatory requirements applicable to this unit at the time of publication.

Pre-requisite Unit

MARH025 Apply knowledge of dynamic positioning fundamentals

MARH027 Apply knowledge of dynamic positioning systems

Competency Field

H - Navigation

Unit Sector

Maritime Sector

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Explain routine dynamic positioning operations

PERFORMANCE CRITERIA

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

- 1.1** Effective dynamic positioning watch keeping procedures are described
- 1.2** Pre-operational checks and checklists prior to and during dynamic positioning operations are described
- 1.3** Rationale for record keeping requirements for dynamic positioning operations are explained
- 1.4** Communication with personnel during dynamic positioning operations is outlined
- 1.5** Procedures to be followed by the dynamic positioning operator during handover, approaching a worksite and transferring from conventional navigation to dynamic positioning control are outlined
- 1.6** Structure of alarm/warning and information messages provided on the dynamic positioning system displays and printer are described
- 1.7** Rationale for using failure modes and effects analysis (FMEA), annual trials reports, capability plots, activity specific operational guidelines (ASOG), task appropriate mode (TAM) and critical activity mode of operation (CAMO) documentation during dynamic positioning operations is explained
- 1.8** Content of FMEA, annual trials reports, capability plots, ASOG, TAM and CAMO documentation during dynamic positioning operations is explained

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| | 1.9 | Rationale for planning dynamic positioning operations for emergency and contingency situations is explained |
| | 1.10 | Content of contingency plans to cover foreseeable system failure and operational failures is explained |
| | 1.11 | Use of worksite diagrams in dynamic positioning operations is explained |
| | 1.12 | Hazards associated with conducting dynamic positioning operations in areas of shallow water, very deep water and/or strong tidal conditions are outlined |
| 2 Apply position reference handling principles | 2.1 | Methods used to apply weighting, pooling and voting when multiple position referencing systems are in operation are outlined |
| | 2.2 | Median rejection when multiple position referencing systems are in operation and the importance of monitoring the position reference page is outlined |
| 3 Apply emergency dynamic positioning operations principles | 3.1 | Vessel and other data used to assess the capability of the vessel to successfully complete dynamic positioning operations without a loss of position after worst case failure is described |
| | 3.2 | Conditions which cause the degrading dynamic positioning operational and emergency status are described |
| | 3.3 | Warnings and alarms incorporated into dynamic positioning installations to make personnel aware of degrading conditions are described |
| | 3.4 | Alarms/warnings associated with loss of redundancy after worst case failure and foreseeable loss of heading or position and catastrophic failure as a result of worst case failure are described |
| | 3.5 | ASOG in dynamic positioning degraded or emergency operations are described |
| | 3.6 | Factors to be taken into consideration to carry out appropriate corrective actions are explained |

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.

Non-essential conditions may be found in the MAR Maritime Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This is a new unit. No equivalent unit.

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 MARH026 Apply knowledge of dynamic positioning operations

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:

- describing conditions of dynamic positioning control, thrusters, sensors, position references, power, environment and miscellaneous that causes degrading of dynamic positioning status
- describing the use of capability plots (paper or electronic) and footprint plots to assess the capability of the vessel to complete dynamic positioning operations
- explaining rationale for planning dynamic positioning operations, including emergency and contingency situations which require the use of activity specific operational guidelines (ASOG), task appropriate mode (TAM) and critical activity mode of operation (CAMO)
- explaining requirements of contingency planning, including escape routes, position reference failures, sensors, weather, power, propulsion and worst case failures
- explaining the factors to be taken into account, subsequent to any system failure, in order to determine and carry out appropriate corrective actions, including:
 - changing dynamic positioning status
 - communication
 - monitoring stability of position and heading
 - when to terminate work
- explaining the rationale for keeping logbook records for all dynamic positioning operations, failures and incidents, operation, maintenance and repairs of dynamic positioning and ancillary equipment
- outlining alarms/warnings associated with loss of redundancy after worst case failure and the possible loss of heading or position if another failure occurs after a worst case failure (part loss of some thrusters and power) and catastrophic failure (loss of heading and/or position control)
- outlining of the use of ASOG in dynamic positioning degraded or emergency operations
- outlining the procedures to be followed by the dynamic positioning operator when taking over control of vessel's positioning and manoeuvring.

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 warnings and information messages provided on dynamic positioning system displays and on the dynamic positioning printer
- checklists to be completed prior to and during dynamic positioning operations
- communication to be used when conducting dynamic positioning operations
- contingency plans for foreseeable system failure and operational requirements, including:
 - escape routes
 - position reference failures
 - power
 - propulsion
 - sensors
 - weather
 - worst case failure
- conditions with dynamic positioning control, thrusters, sensors, position references, power, environment and miscellaneous that will lead to degraded dynamic positioning operational or emergency status
- documentation and records for dynamic positioning operations, including the content and purpose of:
 - annual trials reports
 - ASOG
 - CAMO
 - capability plots
 - capability plots (paper and electronic)
 - dynamic positioning manuals
 - FMEA
 - footprint plots
 - logbooks for all dynamic positioning operations, failures and incidents
 - operation, maintenance and repairs of dynamic positioning equipment and ancillary equipment
 - TAM
 - worksite diagrams
- hazards associated with dynamic positioning operations, including operating in:
 - shallow water
 - strong tidal conditions
 - very deep water
- keeping logbooks and records, including:
 - fault logs
 - International Maritime Contractor Association (IMCA) incident report form
 - position reference systems logs
 - records of operation, maintenance and repair of dynamic positioning system and ancillary equipment
- median rejection of when three or more are used and the importance of monitoring the

position reference page

- methods used to apply weighting and pooling and voting when more than one position referencing system, including:
 - importance of monitoring the position reference page
 - medium rejection of when three or more position referencing systems are used
 - planning for dynamic positioning operations, including:
 - ASOG
 - CAMO
 - contingencies
 - emergency situations
 - TAM
 - procedures for conducting dynamic positioning operations, including:
 - taking over the control of the vessels positioning and manoeuvring
 - approaching a worksite
 - transferring from conventional navigation to dynamic positioning control
 - alarms/warnings associated with loss of redundancy after worst case failure and the possible loss of heading or position if another failure occurs after a worst case failure (part loss of some thrusters and power) and catastrophic failure (loss of heading and/or position control)
 - structure of alarm/warning and information messages provided on the dynamic positioning system displays and on the dynamic positioning printer
 - use of the ASOG in dynamic positioning degraded or emergency operations and the factors to be taken into account, subsequent to any system failure, in order to determine and carry out appropriate corrective actions, including:
 - changing dynamic positioning status
 - communication
 - monitoring stability of position and heading
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- warnings and alarms associated with degrading conditions for:
 - dynamic positioning control
 - environment
 - position references
 - power
 - sensors
 - thrusters
 - watch handover procedures, including:
 - completing appropriate checklists
 - dynamic positioning status
 - field operations
 - status boards
 - vessel operations
 - vessel status
 - weather forecasts

- watch keeping procedures, including:
 - checklists
 - internal and external communications
 - maintaining lookout
 - manning of dynamic positioning console
 - observing recognised safe working practices, in relation to operations and dynamic positioning watch keeping.

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 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 replicate 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:

- applicable documentation, such as workplace procedures and dynamic positioning operational manuals, FMEA and capability plots. ASOG, TAM and CAMO
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE) currently used in industry.

Links

Companion Volume Implementation Guides are found in VETNet -

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