

Competency Framework for Watchkeeper Deck less than 500GT Near Coastal

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Function: Navigation at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position</p> <p>Note training and assessment in the use of ECDIS is not required for those who serve exclusively on ships not fitted with ECDIS. This limitation shall be reflected in the endorsement issued to the seafarer concerned</p>	<p>Navigation</p> <p>Ability to determine the ship's position by the use of:</p> <ul style="list-style-type: none"> • .landmarks • aids to navigation, including lighthouses, beacons and buoys • dead reckoning, taking into account winds, tides, currents and estimated speed <p>Thorough knowledge of and ability to use nautical charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ship's routing information</p> <p>Chartwork</p> <p>1. Demonstrates ability to interpret information on Admiralty charts</p> <p>1.1 Recognises chart symbols and abbreviations</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training where appropriate</p> <p>.4 approved laboratory equipment training</p> <p>Using chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-</p>	<p>Information from nautical charts and publications is relevant, interpreted correctly and properly applied</p> <p>The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The position is determined within the limits of acceptable instrument/system errors</p> <p>The reliability of the information</p>

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<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>1.2 Understands the significance of the Notes, Warnings and Chart Datums</p> <p>2. Recognises chart projections; Gnomonic, Mercator and Port Plans</p> <p>2.1 Outline the knowledge and use of gnomonic projection and port plans</p> <p>2.2 Awareness of the effect of each projection on the shape of the land mass</p> <p>2.3 Awareness of the difference between GC and Rhumb lines</p> <p>3. Position line, circle of position and Transferred position lines</p> <p>3.1 Understands the differences between a position and a position line</p> <p>3.2 Understands the definition of DR, EP and Fix</p> <p>3.3 Plots the ship's dead reckoning position using Compass and Speed log</p> <p>3.4 Plots ship's estimated Position applying set and drift</p> <p>4. Understands the difference between ground and water track</p> <p>5. Fixes position by:</p>	<p>sounding equipment, compass</p>	<p>obtained from the primary method of position fixing is checked at intervals</p> <p>Calculations and measurements of navigational information are accurate</p> <p>The charts selected are the largest scale suitable for the area of navigation, and charts and publications are corrected in accordance with the latest information available</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>5.1 Compass bearings</p> <p>5.2 Ranges and bearings</p> <p>6. Understands the use of Danger Angles and Danger Circles</p> <p>6.1 Calculates the correct danger angle allowing for height of tide</p> <p>7. Fix ship's position using echo Sounder</p> <p>7.1 Use of line of soundings combined with range or bearing</p> <p>8. Introduction to Voyage Planning</p> <p>Planning and conducting a passage including Position Determination.</p> <p>8.1 Awareness of the Key elements;</p> <ul style="list-style-type: none"> • Appraisal • Planning • Execution • Monitoring <p>8.2 Awareness of sources of information</p> <ul style="list-style-type: none"> • Navigational charts (including ECDIS and RCDS) • Sailing directions 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training where appropriate</p> <p>.4 approved laboratory equipment training</p> <p>Using chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass</p>	<p>Information from nautical charts and publications is relevant, interpreted correctly and properly applied</p> <p>The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The position is determined within the limits of acceptable instrument/system errors</p> <p>The reliability of the information obtained from the primary method of position fixing is checked at intervals</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<ul style="list-style-type: none"> • Light lists, tide tables • Radio navigational warnings and ship routing information • ALRS <p>8.3 Thorough knowledge and ability to use ECDIS to plan and conduct a passage</p> <p>8.4 Knowledge of application of ICS Bridge Procedures Guide</p> <p>Chart Correcting</p> <p>1. Understands the importance of up to date charts</p> <p>1.1 Recognise the latest correction on a chart</p> <p>1.2 Understands how to check that a chart is up to date</p> <p>2. Understands information contained in the weekly Notices to mariners and cumulative lists of chart corrections</p> <p>2.1 Demonstrates ability to correct charts accurately</p> <p>2.2 Demonstrates ability to correct other publications including ALL, ALRS etc</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training where appropriate</p> <p>.4 approved laboratory equipment training</p> <p>Using chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass</p>	<p>Calculations and measurements of navigational information are accurate</p> <p>The charts selected are the largest scale suitable for the area of navigation, and charts and publications are corrected in accordance with the latest information available</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p>	<p>Notices to Mariners</p> <p>1. Understands the importance of up to date information</p> <p>1.1 Uses NAVTEX and radio to obtain latest information before and during voyage</p> <p>2. Understands use and value of T's & P's</p> <p>3. Awareness of the contents of the Annual Summary of N to M</p> <p>Tides and tidal Calculations</p> <p>1. Tides and calculations</p> <p>1.1 Understands basic causes of tides</p> <p>1.2 Differentiates between Spring and Neap tides</p> <p>1.3 Understands the relationship between Chart datum. LATS, MHWS etc</p> <p>1.4 Understands information contained in the Admiralty Tide Tables</p> <p>1.5 Calculates height and range of tide at standard ports</p> <p>1.6 Calculates height of tide for a given time at standard and secondary ports</p> <p>1.7 Calculates the time for a given height of tide at</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training where appropriate</p> <p>.4 approved laboratory equipment training</p> <p>Using chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass</p>	<p>Information from nautical charts and publications is relevant, interpreted correctly and properly applied</p> <p>The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The position is determined within the limits of acceptable instrument/system errors</p> <p>The reliability of the information obtained from the primary method of position fixing is checked at</p>

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	<p>standard and secondary ports</p> <p>1.8 States the difference in calculation of Pacific tides including secondary ports</p> <p>1.9 Find and predict set and rate of the tide from tidal reference points on the chart and tidal stream atlas</p> <p>Buoyage system</p> <p>1. Understands IALA system A & B</p>		<p>intervals</p> <p>Calculations and measurements of navigational information are accurate</p> <p>The charts selected are the largest scale suitable for the area of navigation, and charts and publications are corrected in accordance with the latest information available</p>
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>Navigational aids and equipment</p> <p>Ability to operate safely and determine the ship's position by use of all navigational aids and equipment commonly fitted on board the ships concerned</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p>	<p>Electronic systems of position fixing and navigation</p> <p>Navigation Aids</p> <p>1. Hyperbolic Navigation systems</p> <p>Understands the propagation of electro-magnetic waves with particular reference to:</p> <ul style="list-style-type: none"> • Frequency and wavelength • Ground wave, sky wave • Ionospheric affects <p>2. Satellite Navigation Systems (GNSS)</p> <p>2.1 understands the principle of satellite navigation systems</p> <p>2.2 aware of the errors in GNSS and their causes</p> <p>2.3 demonstrate an understanding of the terms DOPS etc</p> <p>2.4 Aware of the problems associated with datum shifts</p> <p>2.5 An outline knowledge of Differential GNSS</p> <p>Speed Logs</p> <p>1. Basic knowledge of measuring speed and distance through the water</p> <p>2. Towed and rotating logs</p> <p>3. Doppler logs</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>practice and IMO resolutions on performance standards for navigational equipment</p> <p>Interpretation of information obtained from Radar is in accordance with accepted navigational practice and takes account of the limits and accuracy levels of Radar</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p>	<p>3.1 Knowledge of Doppler shift 3.2 Explains the method used in Doppler log to measure ship speed 3.3 States that speed can be measured in all directions 3.4 Understands the errors of a Doppler log system; and 3.5 Understands the dangers associated with Doppler logs for speed input into true motion Radar and ARPA</p> <p>4. Electromagnetic and Impellor logs 3.1 Knowledge of the principles of operation 3.2 Understand these logs read speed through the water; and 3.3 Understand the errors of these logs</p> <p>AIS</p> <p>1. Is aware of AIS concepts 1.1 Understands the objectives of AIS 1.2 Aware of the system concepts of AIS 1.3 Aware of the SOTDMA concept 1.4 Describes major constituents of a shipborne system</p> <p>2. Understands the elements of AIS data 2.1 Understands the information included in static data 2.2 Understands the information included in dynamic data 2.3 Understands the information included in voyage</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational practice and IMO resolutions on performance standards for navigational equipment</p> <p>Interpretation of information obtained from Radar is in accordance with accepted navigational practice and takes account of the limits and accuracy levels of Radar</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>related data</p> <p>2.4 Understands the associated transmission intervals for each group of data</p> <p>2.5 Understands the use of safety and security related messages</p> <p>2.6 Aware of the use of AIS as aids to navigation</p> <p>3. AIS Ship Installations</p> <p>3.1 Understands carriage requirements</p> <p>3.2 Understands the MKD configuration</p> <p>3.3 Understands the Radar/ECDIS configuration</p> <p>4. Use of AIS at sea</p> <p>4.1 Understands the need for checks of own ship input data</p> <p>4.2 Understands the use of AIS data on a radar ECDIS display</p> <p>4.3 Aware of caution when making decisions based on AIS target data</p> <p>4.4 Understands the advantages and disadvantages of AIS compared with radar</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>Navigational aids and equipment (continued)</p> <p><i>Echo-sounders</i></p> <p>1. Understand the echo ranging principles</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good</p>

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	<p>2. Use of echo ranging for depth calculation</p> <p>3. Time base measurement</p> <p>4. Understand the operation of a simple echo sounder</p> <p>5. Demonstrates the correct setting up procedures</p> <p>5.1 Correct range</p> <p>5.2 Alarms</p> <p>5.3 Correct gain</p> <p>5.4 Correct datum (depth below keel)</p> <p>6. Understands the errors of the Echo sounders</p> <p>6.1 Effect of water density</p> <p>6.2 Effect of shallow water</p> <p>6.3 Aeration</p> <p>6.4 Cavitation</p> <p>6.5 Multiple returns (second trace)</p> <p>7. Dangers and correct use of Phased scale</p>		<p>navigational practice and IMO resolutions on performance standards for navigational equipment</p>
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>Navigational aids and equipment (continued)</p> <p><i>Radar Navigation</i></p> <p>Knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA)</p> <p>1. Principles of Radar</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Use of radar and ARPA to maintain safety of navigation</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to the seafarer concerned</p>	<p>1.1 Understands echo ranging principle</p> <p>1.2 Understands the principle of the Radar beam</p> <p>1.3 Describes the function of the scanners and associated aerial system</p> <p>1.4 Describes bearing determination by azimuth scanner</p> <p>1.5 Appreciates the importance of vertical beam width</p> <p>1.6 Understands factors affecting minimum range and discrimination;</p> <ul style="list-style-type: none"> • Pulse repetition Frequency • Pulse Length • Target aspect • Height of scanner <p>1.7 Understands the factors affecting target size and quality;</p> <ul style="list-style-type: none"> • Aspect of target • Material <p>1.8 Understands the errors in Radar information and identifies false targets:</p> <ul style="list-style-type: none"> • Multiple echoes • Side lobes • Shadow and Blind sectors • Second trace echoes 	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>navigational practice and IMO resolutions on performance standards for navigational equipment</p> <p>Interpretation of information obtained from Radar is in accordance with accepted navigational practice and takes account of the limits and accuracy levels of Radar</p> <p>Information obtained from radar and ARPA is correctly interpreted and analysed, taking into account the limitations of the equipment and prevailing</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p> <p>Use of radar and ARPA to maintain safety of navigation (continued)</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement</p>	<ul style="list-style-type: none"> • Meteorological effects <p>2. Operation of the Radar</p> <p>2.1 Understands correct setting up procedure</p> <p>2.2 Understands the action of each of the following controls;</p> <ul style="list-style-type: none"> • Brilliance, Gain, Tuning, Pulse Length, Range • Clutter, sea and rain • Auto clutter controls <p>2.3 Understands the use of the heading marker</p> <ul style="list-style-type: none"> • Understands the dangers of incorrectly aligned heading marker • Uses the heading marker switch correctly during watch keeping <p>2.4 Takes ranges and bearings using the electronic bearing line (EBL) and variable range markers</p> <p>2.5 Understands the errors in range and bearing</p> <p>2.6 Understands the use of the offset electronic range and bearing line (ERBL)</p> <p>2.7 Understands parallel indexing techniques;</p> <ul style="list-style-type: none"> • Understands the methods of parallel indexing using index lines • Sets up index lines correctly <p>2.8 Correctly interprets the information supplied by the Radar</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>circumstances and conditions</p> <p>Action taken to avoid a close encounter or collision with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>Decisions to amend course and/or speed are both timely and in accordance with accepted navigational practice.</p> <p>Adjustments made to the ship's course and speed maintain safety of navigation</p>

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<p>issued to the seafarer concerned</p>	<p>2.9 Displays and interprets relative and true tracks correctly</p> <p>3. Radar Plotting</p> <p>3.1 Understands the method of laying out a paper plot</p> <ul style="list-style-type: none"> • The Plotting Triangle (WOA Triangle) • Understands CPA • TCPA and method of calculating the true target track <p>3.2 Interprets plotted information correctly and acts according to IRCPS</p> <p>3.3 Understands the effects of alteration of course and/or speed of own ship</p> <p>3.4 Demonstrates the effect of an alteration of course and/or speed for a critical target on the CPAs of other ships</p> <p>ARPA (Note: The term 'ARPA' includes 'Target Tracking')</p> <p>IMO Performance standards for ARPA</p> <p>1. An appreciation of the performance standards in particular the standards relating to accuracy</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Communication is clear, concise and acknowledged at all times in a seamanlike manner.</p> <p>Manoeuvring signals are made at the appropriate time and are in accordance with the International regulations for Preventing Collisions at Sea, 1972, as amended</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p> <p>Use of radar and ARPA to maintain safety of navigation (continued)</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement</p>	<p>Factors affecting system performance and accuracy</p> <p>2. Knowledge of ARPA sensor input parameters- radar, compass and speed inputs and the effects of sensor malfunction on the accuracy of ARPA data</p> <p>3. Knowledge of;</p> <p>3.1 The effects of the limitations of radar range and bearing discrimination and accuracy and the limitations of compass and speed input accuracies on the accuracy of ARPA data</p> <p>3.2 Factors which influence vector accuracy</p> <p>Tracking capabilities and limitations</p> <p>4. Knowledge of:</p> <p>4.1 The criteria for the selection of targets by automatic acquisition</p> <p>4.2 The factors leading to the correct choice of targets for manual acquisition</p> <p>4.3 The effects on tracking of lost targets and target fading</p> <p>4.4 The circumstances causing ‘target swap’ and its effects on displayed data</p> <p>4.5 The limits imposed on both types of acquisition in multi-target scenarios</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational practice and IMO resolutions on performance standards for navigational equipment</p> <p>Interpretation of information obtained from Radar is in accordance with accepted navigational practice and takes account of the limits and accuracy levels of Radar</p> <p>Information obtained from</p>

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<p>issued to the seafarer concerned</p>	<p>Processing delays</p> <p>5. Knowledge of:</p> <p>5.1 The delays inherent in the display of processed ARPA information, particularly on acquisition and re-acquisition or when a tracked target, or own ship, manoeuvres</p> <p>Operational warnings</p> <p>6. Appreciation of:</p> <p>6.1 The uses, benefits and limitations of ARPA operational warnings and their correct setting, where applicable, to avoid spurious alarms and distraction</p> <p>True and Relative vectors and typical graphic representation of target information and danger areas</p> <p>7. Thorough knowledge of true and relative vectors, derivation of targets' true courses and speeds including:</p> <p>7.1 Threat assessment, derivation of predicted closest point of approach and predicted time to closest point of approach from forward extrapolation of vectors, the use of graphic representation of danger areas</p> <p>7.2 The effects of alteration of course and/or speed of own ship and/or targets on predicted closest point of</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>radar and ARPA is correctly interpreted and analysed, taking into account the limitations of the equipment and prevailing circumstances and conditions</p> <p>Action taken to avoid a close encounter or collision with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>Decisions to amend course and/or speed are both timely and in accordance with accepted navigational</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p> <p>Use of radar and ARPA to maintain safety of navigation (continued)</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement</p>	<p>approach and predicted time to closest point of approach and danger areas</p> <p>7.3 The effects of incorrect vectors and danger areas</p> <p>7.4 The benefits of switching between true and relative vectors</p> <p>Information on past positions of targets being tracked</p> <p>8. Knowledge of:</p> <p>8.1 The derivation of past positions of targets being tracked</p> <p>8.2 Recognition of historic data as a means of indicating recent manoeuvring of targets and as a method of checking the validity of the ARPA's tracking</p> <p>Setting up and maintaining displays</p> <p>9. Ability to demonstrate:</p> <p>9.1 The selection of display presentation; stabilised relative motion displays and true motion displays</p> <p>9.2 The correct adjustment of all variable radar display controls for optimum display of data</p> <p>9.3 The selection as appropriate of required speed input</p> <p>9.4 The selection of ARPA tracking controls, manual automatic acquisition, vector/graphic display of data</p> <p>9.5 The selection of the time scale of vectors/graphics</p> <p>9.6 The use of exclusion areas when automatic</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>practice.</p> <p>Adjustments made to the ship's course and speed maintain safety of navigation</p> <p>Communication is clear, concise and acknowledged at all times in a seamanlike manner.</p> <p>Manoeuvring signals are made at the appropriate time and are in accordance with the International regulations for Preventing Collisions at Sea, 1972, as amended</p>

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<p>issued to the seafarer concerned</p>	<p>acquisition is utilized</p> <p>9.7 Performance checks of radar, compass and speed input sensors and ARPA</p> <p>Obtaining information from the ARPA display</p> <p>10. Ability to obtain information in both relative and true modes of display, including:</p> <p>10.1 The identification of critical echoes</p> <p>10.2 The speed and direction of target’s relative movement</p> <p>10.3 The time to and predicted range at target’s closest point of approach</p> <p>10.4 The courses and speeds of targets</p> <p>10.5 Detecting changes of targets’ courses and speeds and the limitations of such information</p> <p>10.6 The effect of changes in own ship’s course or speed or both</p> <p>10.7 The operation of the trial manoeuvre</p> <p>10.8 The use and limitations of the mapping facility</p> <p>Application of the International Regulations for Preventing Collision at Sea</p> <p>11. Analysis of potential collision situations from displayed information, determination and execution of action to avoid close quarters situations in accordance with the International Regulations for</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	Preventing Collision at Sea		
<p><i>Plan and conduct a passage and determine position (continued)</i></p> <p>Use of ECDIS to maintain the safety of navigation</p> <p>Note: Training and assessment in the use of ECDIS is not required for those who serve exclusively on ships not fitted with ECDIS. This limitation shall be reflected in the endorsements issued to the seafarer</p>	<p>Navigation aids and equipment (continued)</p> <p><i>Navigation using ECDIS</i></p> <p>1. Electronic Chart Display and Information systems</p> <p>1.1 Understands the difference between ECS and ECDIS</p> <p>1.2 Understands the principal types of electronic charts available</p> <ul style="list-style-type: none"> • Raster charts • Vector charts • Be aware of S-52 and S-57 IHO performance standards • Be aware of the significance of ENC and their use with ECDIS <p>1.3 Basic navigational functions and settings</p> <p>1.4 Specific functions of route monitoring</p> <p>1.5 Radar and ARPA and AIS overlays</p> <p>1.6 Status indications, indicators and alarms</p> <p>1.7 Integrity monitoring</p> <p>1.8 Risk of over reliance on ECDIS</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved training ship experience</p> <p>.2 approved ECDIS simulator training</p>	<p>Monitors information on ECDIS in a manner that contributes to safe navigation</p> <p>Information obtained from ECDIS(including radar overlay and or radar tracking functions, when fitted) is correctly interpreted and analysed, taking into account the limitations of the equipment, all connected sensors (including radar and AIS where interfaced) and prevailing circumstances and conditions</p> <p>Safety of navigation is</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
concerned	<p>1.9 Awareness of updating and correcting ECDIS chart</p> <p>1.10 Awareness of backup systems in event of ECDIS failure</p> <p>2. Understands the display of the ship position symbol on ECS;</p> <p>2.1 DGPS and Loran-C etc</p> <p>2.2 Understands the potential errors due to incorrect chart Datum</p> <p>2.3 Understands the limitations of accuracy</p>		<p>maintained through adjustments made to the ship's course and speed through ECDIS-controlled track-keeping functions (when fitted)</p> <p>Communication is clear, concise and acknowledged at all times in a seaman like manner</p>
<p>Plan and conduct a passage and determine position (continued)</p>	<p><i>Navigational aids and equipment (continued)</i></p> <p><i>Bridge Resource Management</i></p> <p>1. Knowledge of bridge resource management principles, including:</p> <p>1.1 .Allocation, assignment, and prioritization of resources</p> <p>1.2 .Effective communication</p> <p>1.3 .Assertiveness and leadership</p>	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p>	<p>1.4 .Obtaining and maintain situational awareness</p> <p>1.5 .Consideration of team experience</p> <p>2. The above may be assessed within Bridge Simulator Training using continuous assessment whilst the candidate is undertaking the following criteria:</p> <p>2.1 The advantages and disadvantages of different Radar display modes are clearly understood with respect to target detection and tracking</p> <p>2.2 Appropriate use is made of sea and ground stabilised Radar displays selecting appropriate course and speed sensor inputs</p> <p>2.3 The correct interpretation of Radar information is clearly demonstrated</p> <p>2.4 Evidence of the above will be demonstrated by the candidates appropriate use of modes of display, appropriate length of trails, and appropriate control of vectors</p> <p>2.5 Action taken to avoid a close encounter, or collision, with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea;</p> <ul style="list-style-type: none"> • Action taken will be made in ample time and will result in passing at a safe distance; if the candidate is in doubt (in the role of OOW/ Chief 	<p>Assessment of evidence from approved navigational aids and simulator training</p>	<p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviors are identified</p> <p>Team member(s) share accurate understanding of current and predicted vessel state, navigation path, and external environment</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a passage and determine position (continued)</p>	<p>Officer) he/she should inform the Master</p> <ul style="list-style-type: none"> • When appropriate the candidate will verify collision avoidance manoeuvres, and subsequent return to track, utilizing trial manoeuvre <p>2.6 The candidate (as OOW/Chief officer) when in charge of the navigation will:</p> <ul style="list-style-type: none"> • Fix the vessel's position at appropriate intervals by the best means and check the position by a second means when possible • Monitor and maintain the planned track by Parallel Index when possible • When navigating by ECDIS will: <ul style="list-style-type: none"> ○ maintain the ECDIS display at the appropriate range ○ Maintain an appropriate look ahead ○ Maintain appropriate safety settings and safety zone ○ Display appropriate information and object layers ○ Recognise and respond to alarms and warnings ○ Monitor the integrity of the system by cross checking against appropriate PI information, Radar overlay or ARPA overlay, as available <ul style="list-style-type: none"> ▪ Maintain a visual lookout at all times ▪ Maintain a VHF listening watch on the 	<p>Assessment of evidence from approved navigational aids and simulator training</p>	

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p style="text-align: center;">appropriate channels</p> <p>2.7 The candidate (as OOW/Chief Officer) when in charge of the navigation will:</p> <ul style="list-style-type: none"> • Utilise AIS target data to maintain situation awareness <p>2.8 If in any doubt, the candidate (as OOW/Chief Officer) will inform the Master</p>		
<p><i>Plan and conduct a passage and determine position (continued)</i></p>	<p>Compasses</p> <p>Knowledge of the errors and corrections of magnetic compass</p> <p>Knowledge of the errors and corrections of the gyro compass</p> <p>Ability to determine errors of the compass, using terrestrial means, and to allow for such errors</p> <p>Compass-Magnetic and Gyro</p> <p>Magnetic Compass</p> <p>1. Magnetic Compass</p> <p>1.1 Understands basic magnetism</p> <p>1.2 Draws a diagram of the earth’s magnetic field</p> <p>1.3 Understands the difference between Magnetic and</p>		<p>Errors in magnetic and gyro-compasses are determined and correctly applied to courses and bearings</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Geographic poles</p> <p>1.4 Understand the Magnetic Meridian</p> <p>1.5 Explains the reason for Magnetic Variation</p> <p>1.6 Recognises the method of obtaining local magnetic variation from the chart</p> <p>2. Understands Deviation of the magnetic compass</p> <p>2.1 Understands the reasons for the change in deviation of the magnetic compass with changes in the ship's head</p> <p>2.2 Basic knowledge of induced magnetism</p> <p>2.3 Has a basic knowledge of correcting a compass for deviation by use of magnets and soft iron correctors</p> <p>3. Show correct application of Deviation and Variation to Compass courses and Bearings</p> <p>3.1 Converts Compass course to True and True to Compass</p> <p>3.2 Converts Compass bearings to True bearings and True bearings to Compass bearings</p> <p>4. Understands the need for regular checks of the Compass error</p> <p>4.1 Demonstrates the ability to calculate compass error using transits</p>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>4.2 Applies compass error correctly</p> <p>Gyro Compass</p> <ol style="list-style-type: none"> 1. Understands the practical application of the gyro compass <ol style="list-style-type: none"> 1.1 Understands the need to regularly check the accuracy of the gyro compass 2. Calculates gyro error using transits 3. Applies latitude and speed correction correctly 4. Understand the care and use of the gyro compass and associated equipment including the starting and stopping procedures and instrumental errors 5. Describe the gyro repeater, and discuss the initial setting and accuracy checks 6. Understands that repeaters relay heading information to bridge instruments such as Radar, auto helm, course recorders etc 		
<p>Plan and conduct a passage and determine position</p>	<p><i>Automatic Pilot</i></p> <p><i>Steering control systems</i></p>		<p>The selection of the mode of steering is most suitable for the prevailing weather, sea and</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
(continued)	<p>1. Knowledge of steering control systems:</p> <p>1.1 Including automatic pilot</p> <p>1.2 Operational procedures and change over from manual to automatic control and visa-versa</p> <p>1.3 Adjustment of controls for optimum performance</p>		<p>traffic conditions and intended manoeuvres</p>
<p>Plan and conduct a passage and determine position (continued)</p>	<p>Meteorology</p> <p>Ability to use and interpret information obtained from shipborne meteorological instruments</p> <p>Knowledge of the characteristics of the various weather systems, reporting procedures and recording systems</p> <p>Ability to apply the meteorological information available</p> <p>1. Understanding wind strength and direction</p> <p>1.1 States and explains the practical use of Buys Ballot's Law</p> <p>1.2 Explain the factors, including Coriolis force, which effect the strength and direction of the wind</p> <p>2. Understands the causes of local winds</p> <p>2.1 Describes with the aid of a simple diagram the formation of land and sea breezes</p> <p>2.2 Describes katabatic winds and the associated dangers to vessels under 500 GT</p>		<p>Measurements and observations of weather conditions are accurate and appropriate to the passage</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>2.3 Describes how local effects may modify winds caused by pressure systems and the effects on sea conditions</p> <p>2.4 Determines from a surface analysis chart the strength and direction of the wind</p> <p>3. Understands the effects of water vapour in the atmosphere</p> <p>3.1 Defines dew point and relative humidity</p> <p>3.2 Describes the formation of cloud</p> <p>3.3 Describes the formation of advection, frontal and radiation fog</p> <p>4. Understands the practical use and care of common meteorological instruments</p> <p>4.1 Describes the operation and use of the aneroid barometer</p> <p>4.2 Gives a simple explanation of the function of the barograph. Describes its practical use in forecasting weather conditions</p> <p>4.3 Explains the use of wet and dry bulb thermometers and the practical use of the information obtained</p> <p>5. Understands the movement and occurrence of tropical revolving storms (TRS)</p> <p>5.1 States the principal areas and times of year when</p>		<p>Meteorological information is correctly interpreted and applied to maintain the safe passage of the vessel</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>tropical revolving storms can be expected</p> <p>5.2 Understands the formation of a tropical revolving storm</p> <p>5.3 States the weather conditions in and near a TRS and the dangers to small vessels</p> <p>5.4 Describes with the aid of a simple diagram the normal tracks of tropical revolving storms</p> <p>5.5 State the actions to avoid a TRS</p> <p>6. Understands the sources of weather information available to ships</p> <p>6.1 Knowledge of the published sources of information, including The Mariners Handbook, Admiralty List of Radio Signals Vol.3, NP 283 (1 &), Routing charts, Admiralty Sailing Directions and Ocean Passages of the World</p> <p>6.2 Knowledge of broadcast sources of information, including weather facsimile, satellite pictures, text messages, NAVTEX and internet</p> <p>6.3 Describes a surface analysis chart, forecast chart, synoptic chart, surface wave chart and prognostic chart</p>		
<p>Maintain a safe navigational watch</p>	<p>Watchkeeping Thorough knowledge of content, application and intent of the</p>	<p><i>Examination and assessment of evidence obtained from</i></p>	<p>The conduct, handover and relief of the watch</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain a safe navigational watch <i>(continued)</i></p>	<p>International Regulations for Preventing Collisions at Sea, 1972 as amended</p> <p>Knowledge of content of the principles to be observed in keeping a navigational watch</p> <p>Use of routing in accordance with General Provisions on Ship's Routing</p> <p>Use of reporting in accordance with the general Principles for Ship reporting Systems and with VTS procedures</p> <p>1. International Regulations for the Prevention of Collision at Sea</p> <p>1.1 Full knowledge of the IRPCS</p> <p>2. Understands the principles to be observed in keeping as safe navigational watch</p> <p>2.1 Demonstrates an understanding of the application of the STCW Code and in particular Chapter VIII (standards regarding Watchkeeping)</p> <p>2.2 Appreciates the requirement for all crew to be well rested before standing a navigational watch</p> <p>2.3 Is fully aware of the implications of the requirement to keep a proper lookout</p> <p>2.4 Understands the importance of regular checking of the vessels position and action to be taken if found off track</p>	<p><i>one or more of the following:</i></p> <p>.1 approved in-service experience;</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>conforms with accepted principles and procedures</p> <p>A proper lookout is maintained at all times and in such a way as to conform to accepted principles and procedures</p> <p>Lights and shapes and sound signals conform with the requirements contained in the International regulations for the Prevention of Collisions, 1972, as amended, and are correctly recognised</p> <p>The frequency and extent of monitoring of</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain a safe navigational watch <i>(continued)</i></p>	<p>2.5 Explains the handover procedure when taking over a navigational watch</p> <p>2.6 Describes the Bridge log book entries to be made and any other navigational records which are required</p> <p>2.7 States the circumstances when the Master should be called</p> <p>2.8 Explains the actions to be taken when encountering and during a period of restricted visibility</p> <p>2.9 Explains the requirements for keeping a watch on a vessel at anchor</p> <p>3. Understands the responsibilities of the Officer of the Watch in relation to a Pilot on a vessel under pilotage</p> <p>3.1 States the precautions to be taken on deck when embarking and disembarking a pilot</p> <p>3.2 States the authority and responsibility of the pilot in the conduct of the navigation of the vessel</p> <p>3.3 Understands the responsibilities of the Officer of the Watch and the Master in relation to the pilot and the safe navigation of the vessel</p> <p>3.4 Understands the responsibility to closely monitor the position of the vessel when under pilotage</p> <p>4. Understands the responsibilities of the Officer of the Watch in relation to Watchkeeping in Port</p>	<p><i>Examination and assessment of evidence obtained from one or more of the following:</i></p> <p>.1 approved in-service experience;</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>traffic, the ship and the environment conform with accepted principles and procedures</p> <p>Action to avoid close encounters and collision with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>Decisions to adjust course and/or speed are both timely and in accordance with accepted navigation procedures</p> <p>A proper record is maintained of the</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain a safe navigational watch <i>(continued)</i>	<p>5. The use of routeing in accordance with General Provisions on Ship's Routeing</p> <p>6. The use of information from navigational equipment for maintaining a safe navigational watch including:</p> <p style="padding-left: 40px;">6.1 Rate of turn indicators</p> <p style="padding-left: 40px;">6.2 Course recorders</p> <p style="padding-left: 40px;">6.3 NAVTEX</p> <p>7. Knowledge of blind pilotage techniques</p> <p>8. The use of reporting in accordance with the General Principles for Ship Reporting Systems and with VTS procedures</p>	<p><i>Examination and assessment of evidence obtained from one or more of the following:</i></p> <p>.1 approved in-service experience;</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>movements and activities relating to the navigation of the ship</p> <p>Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and under pilotage</p>
Respond to emergencies	<p>Emergency procedures</p> <p>Response to emergencies</p> <p>1. Precautions for the protection and safety of passengers in emergency situations</p> <p>2. Initial assessment of damage and damage control</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training</p>	<p>The type and scale of the emergency is promptly identified</p> <p>Initial actions and, if appropriate, manoeuvring of</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>3. Initial action to be taken following:</p> <ul style="list-style-type: none"> 3.1 Collision 3.2 Grounding 3.3 Flooding 3.4 Major mechanical damage <p>Including initial damage assessment, control of situation and protection of the marine environment</p> <p>4. Appreciation of the procedures to be followed for:</p> <ul style="list-style-type: none"> 4.1 Rescuing persons from the sea 4.2 Assisting a vessel in distress 4.3 Responding to emergencies which arise in port 	<p>ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 practical training</p>	<p>the ship are in accordance with contingency plans and are appropriate to the urgency of the situation and nature of the emergency</p>
<p>Respond to a distress signal at sea</p>	<p>Search and rescue</p> <p>1. Knowledge and use of the contents of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual, distress and emergency signals, and search and rescue around New Zealand and Australia and the Pacific Region</p>	<p>Examination and assessment of evidence obtained from practical instruction or approved simulator training</p>	<p>The distress or emergency signal is immediately recognized</p> <p>Contingency plans and instructions in standing orders are implemented and complied with</p>
<p>Use the IMO</p>	<p>English Language</p>	<p>Examination and assessment of</p>	<p>English language nautical</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Standard Marine communication Phrases and use English in written and oral form</p>	<p>1. Adequate knowledge of the English language to enable the officer to:</p> <ul style="list-style-type: none"> 1.1 Use charts and other nautical publications 1.2 Understand meteorological information 1.3 Understand messages concerning ships safety and operation 1.4 Communicate with other ships, coast stations and VTS centers 1.5 Enable the officer to perform his/her duties with a multilingual crew 1.6 Ability to understand the IMO Standard Marine Communication Phrases (IMO-SMCP) 	<p>evidence obtained from practical instruction</p>	<p>publications and messages relevant to the safety of the ship are correctly interpreted or drafted</p> <p>Communications are clear and understood</p>
<p>Manoeuvre the ship and operate small ship power plants</p>	<p>Ship manoeuvring and handling Knowledge of factors affecting safe manoeuvring and handling and proper procedures for anchoring and mooring</p> <p>The operation of small ship power plants and auxiliaries</p> <p>1. Manoeuvre the ship</p> <ul style="list-style-type: none"> 1.1 Preparation for getting underway, duties prior to proceeding to sea, making Harbour, entering a dock, berthing alongside quays and jetties or other ships, and securing to buoys 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where 	<p>Safe operating limits of ship propulsion, steering and power systems are not exceeded in normal manoeuvres</p> <p>Adjustments made to the ship's course and speed to maintain safety of</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><i>Manoeuvre the ship and operate small ship power plants (continued)</i></p>	<p>1.2 Use and care of mooring lines and other equipment</p> <p>1.3 Helm orders, conning the ship, effects of propellers on the steering of the ship, effects of wind and current, stopping, going astern, turning short around, interaction squat and shallow water, embarking and disembarking a pilot</p> <p>1.4 Action in the event of failure of bridge control, telegraph or steering gear, and emergency steering arrangements</p> <p>1.5 The effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances</p> <p>1.6 The effects of wind and current on ship handling</p> <p>1.7 Manoeuvres and procedures for the rescue of persons overboard</p> <p>1.8 Procedures for anchoring</p> <p>2. Operation of small ship power plants and auxiliaries</p> <p>2.1 Operating principles of Marine power plants including:</p> <ul style="list-style-type: none"> • Diesel engines • Propeller and propeller shaft • Bridge control <p>2.1 Ship's auxiliary machinery including:</p>	<p>appropriate</p> <p>.4 approved training on a manned scale ship model, where appropriate</p>	<p>navigation</p> <p>Plant, auxiliary machinery and equipment is operated in accordance with technical specifications and within safe operating limits at all times</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><i>Manoeuvre the ship and operate small ship power plants (continued)</i></p>	<ul style="list-style-type: none"> • Boilers • Pumps and pumping systems • Generators, alternators and electrical distribution • Stabilisers • Hydraulic systems • Engineering terms 		

Function: Cargo Handling and Stowage at the Operational Level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage</p>	<p>Cargo handling, stowage and securing</p> <p>Knowledge of safe handling, stowage and securing of cargoes, including dangerous, hazardous and harmful cargoes, and their effect on the safety of life and of the ship</p> <p>Use of the International Maritime Dangerous Goods (IMDG) Code</p> <p>1. Explain the principles and safe working practices for the proper loading, stowage and carriage of dry cargoes including:</p> <p>1.1 Loading, discharging, securing and carriage of dry cargoes</p> <p>1.2 Legislation and IMO codes regarding the carriage of dry cargoes including basic working knowledge of dangers associated with the carriage of Dangerous and Hazardous goods, coal, grain and securing manuals</p> <p>1.3 Procedures to ensure efficient cargo operations</p> <p>1.4 Cargo handling equipment including use and</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship</p> <p>.3 approved simulator training, where appropriate</p>	<p>Cargo operations are carried out in accordance with the cargo plan or other documents and established safety rules/regulations, equipment operating instructions and shipboard stowage limitations</p> <p>The handling of dangerous, hazardous and harmful cargoes complies with international regulations and recognised</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage (continued)</p>	<p>maintenance</p> <p>1.5 Cargo calculations</p> <p>2. Explain the principles and safe methods of arranging for the proper loading, stowage and carriage of bulk liquid, chemical and gas cargoes</p> <p>2.1 Loading, discharging securing and carriage of bulk liquid cargoes including common pipeline systems found on tankers and safety equipment used to test atmospheres and legislation and IMO codes relevant to Bulk liquid, chemical and gas cargoes</p> <p>2.2 Tank entry procedures, routine and emergency</p> <p>2.3 Tank and pipeline cleaning</p> <p>2.4 Ballast management</p> <p>2.5 Single/multiple grade cargoes</p> <p>2.6 Liquid cargo calculation</p> <p>3. Explain the duties of an Officer of the Watch (OOW) whilst maintaining a deck cargo watch</p> <p>3.1 Safety procedures</p> <p>3.2 Security</p> <p>3.3 Code of safe working practices</p> <p>3.4 Emergency response</p> <p>3.5 Pollution prevention</p> <p>3.6 Safe access</p> <p>3.7 Cargo handling equipment</p> <p>3.8 Cargo documentation</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship</p> <p>.3 approved simulator training, where appropriate</p>	<p>standards and codes of safe practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>4. Precautions taken to prevent pollution of the marine environment:</p> <ul style="list-style-type: none"> 4.1 International convention for the Prevention of Pollution from Ships (MARPOL) 4.2 Shipboard Marine Pollution Emergency Plans (SMPEP) 4.3 Hazardous goods 4.4 Bunkering operations 		

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ensure compliance with pollution-prevention requirements</p>	<p>Prevention of pollution of the marine environment and anti-pollution procedures Knowledge of the precautions to be taken to prevent pollution of the marine environment Anti-pollution procedures and all associated equipment</p> <p>1. Understanding of the MARPOL regulations</p> <p>1.1 Understands the general content of the IMO international MARPOL pollution prevention regulations with special reference to oil, garbage and bunkering</p> <p>1.2 Lists the 6 annexes</p> <p>1.3 Demonstrates an appreciation of the serious effect of operational or accidental pollution of the Marine Environment and the need to comply with port regulations</p> <p>2. Pollution Prevention Requirements</p> <p>2.1 Precautions to be taken to prevent pollution of the marine environment as required by MARPOL conventions, including Special Areas and the disposal</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved training</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>of pollutants</p> <p>2.2 Basic understanding of the SOPEP manual, Garbage Management Plan and anti-pollution equipment</p> <p>2.3 Knowledge of The Marine Protection Rules and how they apply to vessels under 500 GT</p>		

Function: Controlling the operation of the ship and care for persons on board at the **management level (continued)**

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship</p>	<p>Ship stability</p> <p>Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment</p> <p>Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy</p> <p>Understanding of the fundamentals of watertight integrity</p> <p>1. Understands basic principles of hydrostatics and related terms</p> <p>1.1 Defines density and relative density and explains the use of the marine hydrometer</p> <p>1.2 States the Law of flotation</p> <p>1.3 Defines light displacement, load displacement, deadweight, buoyancy, reserve buoyancy</p> <p>1.4 States that Displacement=Underwater volume x density</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<p>1.5 Calculates the displacement of a box shaped vessel for a given draught and relative density</p> <p>1.6 Calculates the draught and freeboard for a boxed shaped vessel given the displacement and relative density</p> <p>1.7 Is aware of the information given in the hydrostatic data relating to displacement, TPC and KM scales only</p> <p>1.8 Extracts the displacement, TPC and KM from the hydrostatic data for a given mean draught using graphical and tabulated format</p> <p>1.9 Calculates the displacement, change in draught and GM from the tabulated hydrostatic data</p> <p>2. Understands the concept of initial stability</p> <p>2.1 Defines centre of gravity, centre of buoyancy, transverse metacenter, metacentric height, righting lever and righting moment</p> <p>2.2 Draws a diagram for a vessel in stable equilibrium heeled to a small angle to show the positions and forces through the centre of gravity and centre of buoyancy and explains the creation of the righting lever, righting moment, and transverse metacenter</p> <p>2.3 States that righting moment (RM) = GZ x displacement</p> <p>2.4 Explains the concept of the metacentric height (GM)</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<p>as an assessment of initial stability</p> <p>2.5 Describes the motion of stiff and tender vessels and states their advantages and disadvantages</p> <p>2.6 Using a simple diagram, explains the difference between stable, neutral and unstable equilibrium with reference to GM</p> <p>2.7 Describes the effect on GM due to adding, removing and transferring weights including fuel, water, cargo, and retention of water on deck</p> <p>2.8 Explains the effect on GM of suspended weights</p> <p>2.9 States that the effect of free surface can be considered as a reduction in GM or a rise in KG and this change is known as the Free Surface Correction</p> <p>3. Seaworthiness of the ship</p> <p>3.1 Understand fundamentals of watertight integrity, and the closing of all openings including hatches, access hatches and watertight doors</p> <p>3.2 Preparation for heavy weather</p> <p>3.3 Describe the effect on stability of:</p> <ul style="list-style-type: none"> • Raising and lowering weights • Low freeboard • Obstruction of deck freeing arrangements and 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>scuppers</p> <ul style="list-style-type: none"> • Slack tanks <p>4. Understands the precautions in preparing a vessel for sea</p> <p>4.1 Explains the importance of the completion of pre-sailing check-lists</p> <p>4.2 Explains the importance of maintaining watertight integrity including the fitting of storm shutters</p> <p>4.3 Explains the requirement to secure heavy or bulky items</p> <p>4.4 Explains the importance of maintaining access to emergency equipment at all times</p>		
<p>Maintain seaworthiness of the ship (continued)</p>	<p>Ship construction</p> <p>General knowledge of the principal structural members of a ship and proper names for the various parts</p> <p>1. Understands ship construction terminology</p> <p>1.1 Explains and illustrates the following terms:</p> <ul style="list-style-type: none"> • Forward perpendicular • After perpendicular • Length between perpendiculars • Length overall 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<ul style="list-style-type: none"> • Amidships • Beam • Depth • Freeboard • Camber • Sheer • Flare • Centre line • Transverse cross section <p>1.2 States that gross tonnage (GT) is a measurement of the internal volume of the ship and net tonnage is obtained by making deductions from GT</p> <p>1.3 Explains the difference between measurement tonnage and displacement</p> <p>2. Distinguishes between longitudinal, transverse and local stresses due to static and dynamic loading</p> <p>2.1 Explains the causes of longitudinal stresses with reference to hogging and sagging</p> <p>2.2 Explains the effects of dynamic stresses with reference to wave action and loading</p> <p>2.3 Explains how local stresses arise due to panting, pounding, vibration, discontinuities at hull openings and local loading</p> <p>2.4 Is aware how the concept of simple beam analogy relates to a ship's structure sufficient to explain and illustrate tensile and compressive stresses; the neutral</p>	<p>equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<p>axis and significance of material disposal furthest from this plane</p> <p>2.5 Explains the causes of transverse stresses with reference to dry docking and racking</p> <p>3. Understands methods of vessel construction</p> <p>3.1 Is aware that the bottom, side shell and upper deck structure are important strength members</p> <p>3.2 Is aware that large openings in the hull such as hatchways, place additional stresses and strains on a vessels structure</p> <p>3.3 Explains the methods of construction employed to resist the stresses in .2 above with reference to transverse, longitudinal and combined systems of framing and local considerations. The importance of continuity of strength</p> <p>3.4 Describes and illustrates the following terms:</p> <ul style="list-style-type: none"> • Centre girder • Side Girder • Stringers • Transverse bulkheads • Transverse frames • Beams • Beam knee • Floors • Pillars 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<ul style="list-style-type: none"> • Coamings • Insert plates <p>3.5 Draws mid-section sketches of vessels under 500 GT and identifies and explains the function of the principal components given in .3 3 above (vessel types ; general cargo, oil tanker, dredger, tug etc)</p> <p>3.6 Discusses the advantages and disadvantages of wood, steel, aluminium alloy, and Fibre Reinforced Plastic (FRP) and other composite systems used in vessel construction</p> <p>4. Understands plans normally carried on board</p> <p>4.1 Describes the contents of a general arrangement drawing</p> <p>4.2 Describes the types of structural drawings that are normally available onboard and can identify the principal components listed .3 3 above</p> <p>5. Understands the cause and prevention of chemical and galvanic corrosion</p> <p>5.1 Outlines the process of chemical corrosion (e.g. acids and alkalis)</p> <p>5.2 Describes the process of galvanic corrosion between dissimilar metals by explaining the electro chemical cell</p> <p>5.3 Identifies areas prone to galvanic corrosion and explains and illustrates methods of joining dissimilar metals and fittings</p> <p>5.4 Explains the function of a paint system in the</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<p>prevention of corrosion and the importance of its proper maintenance</p> <p>5.5 Describes the process of preparing steel and aluminium plate for paint application</p> <p>5.6 Outlines the principle of cathodic protection using sacrificial anodes</p> <p>6. Understands the functions of classification societies</p> <p>6.1 States the role of the classification society</p> <p>6.2 States the items that will receive special attention during dry dock and annual surveys</p> <p>7. Understands load lines, reserve buoyancy and methods of damage control</p> <p>7.1 Defines the terms freeboard deck, superstructure deck, superstructure, assigned freeboard, weathertight and watertight</p> <p>7.2 States the purpose of the Load Line and is able to sketch an 'all seasons ' Load Line</p> <p>7.3 Defines FWA and states that the FWA =1/48th Summer</p> <p>7.4 Explains the importance of reserve buoyancy and the necessity for maintaining its integrity</p> <p>7.5 States the items which affect the stability and seaworthiness of the ship with reference to: hatchways and coamings, doorways, side scuttles, skylights, windows, ventilators and exhausts, air pipes, and water freeing arrangements</p> <p>7.6 Discusses the routine maintenance to ensure the</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain seaworthiness of the ship (continued)</p>	<p>efficiency of closing arrangements for the items listed in .7 5</p> <p>7.7 Explains the importance of non-return valves on tank vent pipes especially when fitted low down on a vessel</p> <p>7.8 Describes water freeing arrangements, scuppers and freeing ports</p> <p>8. Understands bilge-pumping arrangements</p> <p>8.1 Draws a simple bilge pumping diagram</p> <p>8.2 Describes the following components: pump, strum box, mud box, screw down non-return valve, screw down valve, manifold, overboard discharge</p> <p>8.3 Recognises the correct symbols used for the following components: pump, strum box, mud box, screw down non-return valve, screw down valve, manifold and overboard discharge</p>		<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

**Function: Controlling the operation of the ship and care for persons on board at the operational level
(continued)**

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Prevent, control and fight fires on board</p>	<p>Fire prevention and fire-fighting appliances</p> <p>Ability to organize fire drills</p> <p>Knowledge of classes and chemistry of fire</p> <p>Knowledge of fire-fighting systems</p> <p>Knowledge of action to be taken in the event of fire, including fires involving oil systems</p>	<p>Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3</p>	<p>The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship</p> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The order of</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
			priority and levels and time-scales of making reports and informing personnel on board are relevant to the nature of the emergency and reflect the urgency of the problem
Operate life-saving appliances	<p>Life saving</p> <p>Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids</p>	Assessment of evidence obtained from training and experience as set out in section A-VI/2, paragraphs 1 to 4	Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards
Apply medical first aid on board ship	Medical aid	Assessment of evidence obtained from approved training as set out in section A-	The identification of the probable cause, nature and extent of injuries

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship</p>	<p>VI/4, paragraphs 1 to 3</p>	<p>or conditions is prompt, and treatment minimizes immediate threat to life</p>
<p>Monitor compliance with legislative requirements</p>	<p>Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment</p> <p>1. .Legislative requirements</p> <p>1.1 Basic working knowledge of the following IMO conventions and codes:</p> <ul style="list-style-type: none"> • International Convention for the Standards of Training Certification and Watchkeeping for Seafarers (STCW) • International Convention for the Safety of Life at Sea (SOLAS) • International Convention for the Prevention of Pollution from Ships (MARPOL) • International Ship and Port Facility Security Code (ISPS) • International Safety Management Code (ISM) 	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Monitor compliance with legislative requirements (continued)</p>	<p>1.2 Basic knowledge of the following:</p> <ul style="list-style-type: none"> • Maritime Transport Act (MTA) • Health and Safety in Employment Act (HSEA) • Hazardous Substances and New Organisms (HSNO) • Maritime Rules and Advisory Circulars • Marine Protection rules and Advisory Circulars <p>1.3 Working knowledge of the Safe Ship Management System (SSM) and its replacement the Maritime Operator Safety System (MOSS)</p> <p>1.4 Knowledge and application of the Code of Safe Working Practices for Merchant Seamen including:</p> <ul style="list-style-type: none"> • Have an outline knowledge of the content of COSWP • Understands the precautions to be observed when using lifting equipment • Explains the requirement to use certified chains, shackles, strops and slings • Describes the care, maintenance and records of such equipment • States the need for retesting of equipment to maintain validity of certificates • Understands the significance of the terms Safe 	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Monitor compliance with legislative requirements (continued)</p>	<p>Working Loads and Breaking Strains</p> <ul style="list-style-type: none"> • Understand selection, care and maintenance of wires and ropes of all types <ul style="list-style-type: none"> ○ Explains the correct procedure for inspecting a rope or wire for the effects of damage in order to ascertain its safety ○ Describes the care of synthetic and natural fibre ropes and in particular the factors that affect strength • Understands the precautions to be observed when engaged in mooring, anchoring and towing operations. Explains the dangers involved and the precautions to prevent injury to personnel • Anchoring: <ul style="list-style-type: none"> ○ Explains the precautions necessary for clearing away the anchors for use ○ Explains the importance of communications ○ Explains the precautions to be taken before letting go the anchor ○ States the difference between self-stowing and non self-stowing anchor chain • Mooring <ul style="list-style-type: none"> ○ Explains the correct use of rope and chain stoppers ○ States the dangers of excessive loads on the mooring ropes and the dangers involved should a rope part, with particular reference 	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Monitor compliance with legislative requirements (continued)</p>	<ul style="list-style-type: none"> ○ to snap back zones ○ Explains the correct procedure for securing to a mooring buoy ● Towing <ul style="list-style-type: none"> ○ Understands the precautions to be observed when passing and connecting a towline to another vessel ● Understands the precautions to be observed when rigging stages or bosun’s chairs aloft or overside ● Understands the importance of Risk Assessments and the correct completion of Permits to Work ● Understands the precautions to be observed if involved in an Enclosed Space entry <p>1.5 Basic knowledge of relevant IMO conventions concerning safety of life at sea, and Protection of the Marine Environment</p> <p>1.6 Purpose and application if the International Safety Management (ISM) Code and other applicable safety management systems in New Zealand</p> <p>1.7 Purpose of Flag and Port State Control</p> <p>1.8 Purpose and application of the International Ship and Port Security (ISPS) Code and the Maritime Security Act</p> <p>1.9 Knowledge of the requirements for musters and drills</p>	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>including fire, emergency and abandon ship drills</p> <p>1.10 Understand the legal obligation to ensure a seaworthy vessel</p> <p>1.11 A basic understanding of the laws of salvage</p> <p>1.12 Understanding the requirements for safe manning, hours of work and Watchkeeping</p>		
<p>Contribute to the safety of personnel and ship</p>	<p>Knowledge of personal survival techniques</p> <p>Knowledge of fire prevention and ability to fight and extinguish fires</p> <p>Knowledge of elementary first aid</p> <p>Knowledge of personal safety and social responsibilities</p>	<p>Assessment of evidence obtained from approved training and experience as set out in section A-V1/1, paragraph 2</p>	<p>Appropriate safety and protective equipment is correctly used</p> <p>Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times</p> <p>Procedures designed to safeguard the environment are observed at all times</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
			Initial and follow-up action on becoming aware of an emergency conforms with established emergency response procedures