

## Competency framework for Chief Mate Yacht

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## Function: Navigation at the management level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<b>Plan and conduct a passage and determine position</b>	<p><b><i>Celestial Navigation</i></b></p> <p><b>1. Demonstrates ability to use celestial bodies to determine the ship's position</b></p> <p>1.1 Use instruments and apply corrections to obtain Observed Altitude and Universal Coordinated Time (UTC):</p> <ul style="list-style-type: none"> <li>• use of a sextant and identification and correction of errors</li> </ul> <p>1.2 Calculate, from observations of celestial bodies, the error of the compass:</p> <ul style="list-style-type: none"> <li>• use of an azimuth mirror, pelorus (bearing plate) or other instrument to take bearings.</li> </ul> <p>1.3 Calculate, from observations of celestial bodies, the direction of a position line and a point through which it passes.</p> <p>1.4 Determine the vessel's position from simultaneous celestial observations.</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>Approved in-service experience</p> <p>Approved training ship experience</p> <p>Approved simulator training where appropriate</p> <p>Approved laboratory equipment training</p> <p>Using chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment,</p>	<p>The information obtained from nautical charts and publications is relevant, interpreted correctly and properly applied. All potential navigational hazards are accurately identified</p>
	<p><b><i>Terrestrial and coastal navigation</i></b></p> <p><b>1. Chartwork</b></p>		<p>The primary method of fixing the ship's position</p>

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	<p>1.1 Demonstrates ability to interpret information on Admiralty charts:</p> <ul style="list-style-type: none"> <li>• recognises chart symbols and abbreviations</li> <li>• understands the significance of the Notes, Warnings and Chart Datums.</li> </ul> <p>1.2 Recognises chart projections; Gnomonic, Mercator and Port Plans:</p> <ul style="list-style-type: none"> <li>• outline the knowledge and use of gnomonic projection and port plans</li> <li>• awareness of the effect of each projection on the shape of the land mass</li> <li>• awareness of the difference between GC and Rhumb lines.</li> </ul> <p>1.3 Position line, circle of position and Transferred position lines:</p> <ul style="list-style-type: none"> <li>• understands the differences between a position and a position line</li> <li>• understands the definition of DR, EP and Fix</li> <li>• plots the ship's dead reckoning position using Compass and Speed log</li> <li>• plots ship's estimated Position applying set and drift</li> <li>• plots running fix with tide and leeway.</li> </ul> <p>1.4 Understands the difference between ground and water track.</p>	<p>compass</p>	<p>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> <p>Calculations and measurements of navigational information are accurate</p> <p>The charts selected are the largest scale suitable for the area of</p>

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	<p>1.5 Fixes position by:</p> <ul style="list-style-type: none"> <li>• compass bearings</li> <li>• ranges and bearings</li> <li>• dipping distances</li> <li>• calculates distance off by vertical angle</li> </ul> <p>1.6 Understands the use of Danger Angles and Danger Circles:</p> <ul style="list-style-type: none"> <li>• calculates the correct danger angle allowing for height of tide.</li> </ul> <p>1.7 Fix ship's position using echo Sounder</p> <ul style="list-style-type: none"> <li>• use of line of soundings combined with range or bearing.</li> </ul> <p>1.8 Introduction to Voyage Planning</p> <p><b>2. Planning and conducting a passage including Position Determination.</b></p> <p>2.1 Awareness of the Key elements:</p> <ul style="list-style-type: none"> <li>• appraisal</li> <li>• planning</li> <li>• execution</li> <li>• monitoring.</li> </ul> <p>2.2 Awareness of sources of information:</p> <ul style="list-style-type: none"> <li>• navigational charts (including ECDIS and RCDS)</li> </ul>		<p>navigation, and charts and publications are corrected in accordance with the latest information available</p>

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	<ul style="list-style-type: none"> <li>• sailing directions</li> <li>• light lists, tide tables</li> <li>• radio navigational warnings and ship routing information</li> <li>• ALRS.</li> </ul> <p>2.3 Knowledge of application of ICS Bridge Procedures Guide.</p> <p><b>3. Chart Correcting</b></p> <p>3.1 Understands the importance of up to date charts:</p> <ul style="list-style-type: none"> <li>• recognise the latest correction on a chart</li> <li>• understands how to check that a chart is up to date.</li> </ul> <p>3.2 Understands information contained in the weekly Notices to mariners and cumulative lists of chart corrections:</p> <ul style="list-style-type: none"> <li>• demonstrates ability to correct charts accurately</li> <li>• demonstrates ability to correct other publications including ALL, ALRS etc</li> </ul> <p><b>4. Notices to Mariners</b></p> <p>4.1 Understands the importance of up to date information:</p> <ul style="list-style-type: none"> <li>• uses NAVTEX and radio to obtain latest information before and during voyage.</li> </ul> <p>4.2 Understands use and value of T's &amp; P's</p> <p>4.3 Awareness of the contents of the Annual Summary of N</p>		

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	<p>to M</p> <p><b>5. Tides and tidal Calculations</b></p> <p>5.1 Tides and calculations:</p> <ul style="list-style-type: none"> <li>• understands basic causes of tides</li> <li>• differentiates between Spring and Neap tides</li> <li>• understands relationship between chart datum. LATS, MHWS etc.</li> <li>• understands information contained in the Admiralty Tide Tables</li> <li>• calculates height and range of tide at standard ports</li> <li>• calculates times and heights of tide at secondary European ports</li> <li>• calculates height of tide for a given time at standard and secondary ports</li> <li>• calculates the time for a given height of tide at standard and secondary ports</li> <li>• states the difference in calculation of Pacific tides including secondary ports, and</li> <li>• find and predict set and rate of the tide from tidal reference points on the chart and tidal stream atlas.</li> </ul> <p><b>6. Buoyage system</b></p> <p>6.1 Understands IALA system A&amp; B</p>		

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	<p><b><i>Electronic systems of position fixing and navigation</i></b></p> <p><b>1. Navigation Aids</b></p> <p><b>1.1 Hyperbolic Navigation systems:</b></p> <ul style="list-style-type: none"> <li>• understands the propagation of electro-magnetic waves with particular reference to:               <ul style="list-style-type: none"> <li>– frequency and wavelength</li> <li>– ground wave, sky wave</li> <li>– ionospheric affects</li> </ul> </li> <li>• has a knowledge of the basic principle of Loran c;               <ul style="list-style-type: none"> <li>– time difference</li> <li>– understands the basic principle of the loran c system</li> <li>– understands the errors and limitations of the Loran c system</li> <li>– day/night effect</li> <li>– propagation effect</li> <li>– additional secondary factors</li> </ul> </li> </ul> <p><b>1.2 Satellite Navigation Systems (GNSS)</b></p> <ul style="list-style-type: none"> <li>• understands the principle of satellite navigation systems</li> <li>• aware of the errors in GNSS and their causes</li> <li>• demonstrate an understanding of the terms DOPS etc</li> <li>• aware of the problems associated with datum shifts, and</li> <li>• an outline knowledge of Differential GNSS.</li> </ul>		<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational practice</p>

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	<p><b>2. Speed Logs</b></p> <p><b>2.1</b> Basic knowledge of measuring speed and distance through the water.</p> <p><b>2.2</b> Towed and rotating logs.</p> <p><b>2.3</b> Doppler logs:</p> <ul style="list-style-type: none"> <li>• knowledge of Doppler shift</li> <li>• explains the method used in Doppler log to measure ship speed</li> <li>• states that speed can be measured in all directions</li> <li>• understands the errors of a Doppler log system, and</li> <li>• understands the dangers associated with Doppler logs for speed input into true motion Radar and ARPA.</li> </ul> <p><b>2.4</b> Electromagnetic and Impellor logs:</p> <ul style="list-style-type: none"> <li>• knowledge of the principles of operation</li> <li>• understands these logs read speed through the water, and</li> <li>• understands the errors of these logs.</li> </ul> <p><b>3. AIS</b></p> <p><b>3.1</b> Is aware of AIS concepts:</p> <ul style="list-style-type: none"> <li>• understands the objectives of AIS</li> <li>• aware of the system concepts of AIS</li> <li>• aware of the SOTDMA concept, and</li> <li>• describes major constituents of a shipborne system.</li> </ul> <p><b>3.2</b> Understands the elements of AIS data:</p>		

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	<ul style="list-style-type: none"> <li>• understands the information included in static data</li> <li>• understands the information included in dynamic data</li> <li>• understands the information included in voyage related data</li> <li>• understands the associated transmission intervals for each group of data</li> <li>• understands the use of safety and security related messages, and</li> <li>• is aware of the use of AIS as aids to navigation.</li> </ul> <p><b>3.3</b> AIS Ship Installations:</p> <ul style="list-style-type: none"> <li>• understands carriage requirements</li> <li>• understands the MKD configuration, and</li> <li>• understands the Radar/ECDIS configuration.</li> </ul> <p><b>3.4</b> Use of AIS at sea:</p> <ul style="list-style-type: none"> <li>• understands the need for checks of own ship input data</li> <li>• understands the use of AIS data on a radar ECDIS display</li> <li>• aware of caution when making decisions based on AIS target data, and</li> <li>• understands the advantages and disadvantages of AIS compared with radar.</li> </ul>		
	<p><b><i>Echo-sounders</i></b></p> <p><b>1. Understands the echo ranging principles</b></p>		

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	<p><b>2. use of echo ranging for depth calculation</b></p> <p><b>3. Time base measurement</b></p> <p><b>4. Understands the operation of a simple echo sounder</b></p> <p><b>5. Demonstrates the correct setting up procedures</b></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><b>6. Understands the errors of the Echo sounders</b></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><b>7. Dangers and correct use of Phased scale</b></p>		
	<p><b><i>Compass-magnetic and gyro</i></b></p> <p><b>1. Magnetic Compass</b></p> <p>1.1 Magnetic Compass:</p> <ul style="list-style-type: none"> <li>• understands basic magnetism</li> <li>• draws a diagram of the earth's magnetic field</li> </ul>		Errors in magnetic and gyro-compasses are determined and correctly applied to courses and bearings

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	<ul style="list-style-type: none"> <li>• understands the difference between Magnetic and Geographic poles</li> <li>• understand the Magnetic Meridian</li> <li>• explains the reason for Magnetic Variation, and</li> <li>• recognises the method of obtaining local magnetic variation from the chart.</li> </ul> <p><b>1.2</b> Understands Deviation of the magnetic compass:</p> <ul style="list-style-type: none"> <li>• understands the reasons for the change in deviation of the magnetic compass with changes in the ship's head</li> <li>• basic knowledge of induced magnetism, and</li> <li>• has a basic knowledge of correcting a compass for deviation by use of magnets and soft iron correctors.</li> </ul> <p><b>1.3</b> Show correct application of Deviation and Variation to Compass courses and Bearings:</p> <ul style="list-style-type: none"> <li>• converts Compass course to True and True to Compass, and</li> <li>• converts Compass bearings to True bearings and True bearings to Compass bearings.</li> </ul> <p><b>1.4</b> Understands the need for regular checks of the Compass error:</p> <ul style="list-style-type: none"> <li>• demonstrates the ability to calculate compass error using transits, and</li> <li>• applies compass error correctly.</li> </ul> <p><b>2. Gyro Compass</b></p>		

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	<p><b>2.1</b> Understands the practical application of the gyro compass:</p> <ul style="list-style-type: none"> <li>• understands the need to regularly check the accuracy of the gyro compass.</li> </ul> <p><b>2.2</b> Calculates gyro error using transits.</p> <p><b>2.3</b> Applies latitude and speed correction correctly.</p> <p><b>2.4</b> Understand the care and use of the gyro compass and associated equipment including the starting and stopping procedures and instrumental errors.</p> <p><b>2.5</b> Describe the gyro repeater, and discuss the initial setting and accuracy checks.</p> <p><b>2.6</b> Understands that repeaters relay heading information to bridge instruments such as Radar, auto helm, course recorders etc.</p>		
*	<p><b><i>Steering control systems</i></b></p> <p><b>1. Knowledge of steering control systems:</b></p> <p><b>1.1</b> Including automatic pilot.</p> <p><b>1.2</b> Operational procedures and change over from manual to automatic control and visa-versa.</p> <p><b>1.3</b> Adjustment of controls for optimum performance.</p>		The selection of the mode of steering is most suitable for the prevailing weather, sea and traffic conditions and intended manoeuvres

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	<p><b><i>Meteorology</i></b></p> <p><b>1. Understanding of Global wind distribution</b></p> <p><b>1.1</b> Draws a diagram showing the general Global pressure distribution.</p> <p><b>1.2</b> States and explains the practical use of Buys Ballot's Law.</p> <p><b>1.3</b> Explain the factors, including Coriolis force, which effect the strength and direction of the wind.</p> <p><b>1.4</b> Describes, with the aid of a simple sketch, the general pattern of global circulation of wind over the earth's surface.</p> <p><b>1.5</b> Describes the modifying effect of large landmasses on the general pattern of global circulation of winds.</p> <p><b>1.6</b> Describes the conditions associated with the ITCZ, Trade winds and the Variables.</p> <p><b>1.7</b> Defines the ITCZ.</p> <p><b>2. Understands the causes of local winds</b></p> <p><b>2.1</b> Describes with the aid of a simple diagram the formation of land and sea breezes.</p> <p><b>2.2</b> Describes katabatic winds and the associated dangers to small vessels.</p> <p><b>2.3</b> Describes how local effects may modify winds caused by</p>		<p>Measurements and observations of weather conditions are accurate and appropriate to the passage</p> <p>Meteorological information is correctly interpreted and applied</p>

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	<p>pressure systems and the effects on sea conditions.</p> <p><b>2.4</b> Determines from a surface analysis chart the strength and direction of the wind.</p> <p><b>3. Understands the effects of water vapour in the atmosphere</b></p> <p><b>3.1</b> Defines dew point and relative humidity.</p> <p><b>3.2</b> Describes the formation of cloud.</p> <p><b>3.3</b> Describes the formation of advection, frontal and radiation fog.</p> <p><b>3.4</b> Explains the cause of super- refraction and sub-refraction and the effect these conditions can have on optical radar ranges.</p> <p><b>4. Understands the practical use and care of common meteorological instruments</b></p> <p><b>4.1</b> Describes the operation and use of the aneroid barometer.</p> <p><b>4.2</b> Gives a simple explanation of the function of the barograph. Describes its practical use in forecasting weather conditions.</p> <p><b>4.3</b> Explains the use of wet and dry bulb thermometers and the practical use of the information obtained.</p> <p><b>4.4</b> Explains the operation of a whirling psychrometer and</p>		

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	<p>the practical use of the information obtained.</p> <p><b>5. Understands the movement and occurrence of tropical revolving storms (TRS)</b></p> <p><b>5.1</b> States the principal areas and times of year when tropical revolving storms can be expected.</p> <p><b>5.2</b> Understands the formation of a tropical revolving storm.</p> <p><b>5.3</b> States the weather conditions in and near a TRS and the dangers to small vessels.</p> <p><b>5.4</b> Describes with the aid of a simple diagram the normal tracks of tropical revolving storms.</p> <p><b>5.5</b> State the actions to avoid a TRS.</p> <p><b>6. Understands the sources of weather information available to ships</b></p> <p><b>6.1</b> Knowledge of the published sources of information, including The Mariners Handbook, Admiralty List of Radio Signals Vol.3, NP 283 (1 &amp; ), Routing charts, Admiralty Sailing Directions and Ocean Passages of the World.</p> <p><b>6.2</b> Knowledge of broadcast sources of information, including weather facsimile, satellite pictures, text messages, NAVTEX and internet.</p> <p><b>6.3</b> Knowledge of sources of weather routing information, and explain the advantages of using such systems.</p> <p><b>6.4</b> Describes a surface analysis chart, forecast chart,</p>		

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	synoptic chart, surface wave chart and prognostic chart.		
<b>Maintain a safe navigational watch</b>	<p><b>Watchkeeping</b></p> <p><b>1. International Regulations for the Prevention of Collision at Sea</b></p> <p>1.1 Full knowledge of the IRPCS.</p> <p><b>2. Understands the principles to be observed in keeping as safe navigational watch</b></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>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</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved in-service experience;</li> <li>• Approved training ship experience</li> <li>• Approved simulator training, where appropriate</li> <li>• Approved laboratory equipment training</li> </ul>	<p>The conduct, handover and relief of the watch 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</p>

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	<p>called.</p> <p><b>2.8</b> Explains the actions to be taken when encountering and during a period of restricted visibility.</p> <p><b>2.9</b> Explains the requirements for keeping a watch on a vessel at anchor.</p> <p><b>3. Understands the responsibilities of the Officer of the Watch in relation to a Pilot on a vessel under pilotage</b></p> <p><b>3.1</b> States the precautions to be taken on deck when embarking and disembarking a pilot.</p> <p><b>3.2</b> States the authority and responsibility of the pilot in the conduct of the navigation of the vessel.</p> <p><b>3.3</b> 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><b>3.4</b> Understands the responsibility to closely monitor the position of the vessel when under pilotage.</p> <p><b>4. Understands the responsibilities of the Officer of the Watch in relation to Watchkeeping in Port</b></p> <p><b>5. The use of routeing in accordance with General Provisions on Ship's Routeing</b></p> <p><b>6. The use of information from navigational equipment for maintaining a safe navigational watch including:</b></p>		<p>recognized</p> <p>The frequency and extent of monitoring of traffic, the ship and the environment conform with accepted principles and procedures</p> <p>A proper record is maintained of the 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>

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	<p>6.1 Rate of turn indicators.</p> <p>6.2 Course recorders.</p> <p>6.3 NAVTEX.</p> <p>7. <b>Knowledge of blind pilotage techniques</b></p> <p>8. <b>The use of reporting in accordance with the General Principles for Ship Reporting Systems and with VTS procedures</b></p>		
	<p><b><i>Bridge resource management</i></b></p> <p>1. <b>Knowledge of bridge resource management principles</b></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>1.4 Obtaining and maintain situational awareness.</p> <p>1.5 Consideration of team experience.</p> <p>2. <b>The above may be assessed within Bridge Simulator Training using continuous assessment whilst the candidate is undertaking the following criteria:</b></p> <p>2.1 The advantages and disadvantages of different Radar display modes are clearly understood with respect to</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved training</li> <li>• Approved in-service training</li> <li>• Approved simulator training</li> </ul>	<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> <p>Questionable decisions and/or actions result in appropriate challenge and response</p>

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	<p>target detection and tracking.</p> <p><b>2.2</b> Appropriate use is made of sea and ground stabilised Radar displays selecting appropriate course and speed sensor inputs.</p> <p><b>2.3</b> The correct interpretation of Radar information is clearly demonstrated.</p> <p><b>3. 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</b></p> <p><b>4. Action taken to avoid a close encounter, or collision, with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea:</b></p> <ul style="list-style-type: none"> <li>• 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 Officer) he/she should inform the Master</li> <li>• when appropriate the candidate will verify collision avoidance manoeuvres, and subsequent return to track, utilizing trial manoeuvre.</li> </ul> <p><b>5. The candidate (as OOW/Chief officer) when in charge of the navigation will:</b></p> <p><b>5.1</b> Fix the vessel's position at appropriate intervals by the best means and check the position by a second means</p>		<p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted vessel state, navigation path, and external environment</p>

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	<p>when possible</p> <p><b>5.2</b> Monitor and maintain the planned track by Parallel Index when possible</p> <p><b>5.3</b> When navigating by ECDIS will:</p> <ul style="list-style-type: none"> <li>• maintain the ECDIS display at the appropriate range</li> <li>• maintain an appropriate look ahead</li> <li>• maintain appropriate safety settings and safety zone</li> <li>• display appropriate information and object layers</li> <li>• recognise and respond to alarms and warnings</li> <li>• monitor the integrity of the system by cross checking against appropriate PI information, Radar overlay or ARPA overlay, as available</li> <li>• maintain a visual lookout at all times, and</li> <li>• maintain a VHF listening watch on the appropriate channels.</li> </ul> <p><b>6. The candidate (as OOW/Chief Officer) when in charge of the navigation will:</b></p> <p><b>6.2</b> Utilise AIS target data to maintain situation awareness.</p> <p><b>7. If in any doubt, the candidate (as OOW/Chief Officer) will inform the Master</b></p>		
<p><b>Use of radar and ARPA to</b></p>	<p><b>Radar navigation: knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA)</b></p>	<p>Assessment of evidence obtained from approved radar</p>	<p>Information obtained from radar and ARPA</p>

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<p><b>maintain safety of navigation</b></p> <p><b>Note:</b> 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><b>1. Principles of Radar</b></p> <p><b>1.1</b> Understands echo ranging principle</p> <p><b>1.2</b> Understands the principle of the Radar beam</p> <p><b>1.3</b> Describes the function of the scanners and associated aerial system.</p> <p><b>1.4</b> Describes bearing determination by azimuth scanner.</p> <p><b>1.5</b> Appreciates the importance of vertical beam width.</p> <p><b>1.6</b> Understands factors affecting minimum range and discrimination:</p> <ul style="list-style-type: none"> <li>• pulse repetition Frequency</li> <li>• pulse Length</li> <li>• target aspect, and</li> <li>• height of scanner.</li> </ul> <p><b>1.7</b> Understands the factors affecting target size and quality:</p> <ul style="list-style-type: none"> <li>• aspect of target, and</li> <li>• material.</li> </ul> <p><b>1.8</b> Understands the errors in Radar information and identifies false targets:</p> <ul style="list-style-type: none"> <li>• multiple echoes</li> <li>• side lobes</li> <li>• shadow and Blind sectors</li> </ul>	<p>simulator and ARPA simulator plus in-service experience</p>	<p>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
	<ul style="list-style-type: none"> <li>• second trace echoes, and</li> <li>• meteorological effects.</li> </ul> <p><b>2. Operation of the Radar</b></p> <p><b>2.1</b> Understands correct setting up procedure.</p> <p><b>2.2</b> Understands the action of each of the following controls:</p> <ul style="list-style-type: none"> <li>• brilliance</li> <li>• gain</li> <li>• tuning</li> <li>• pulse</li> <li>• length</li> <li>• range</li> <li>• clutter</li> <li>• sea</li> <li>• rain, and</li> <li>• auto clutter controls.</li> </ul> <p><b>2.3</b> Understands the use of the heading marker:</p> <ul style="list-style-type: none"> <li>• understands the dangers of incorrectly aligned heading marker, and</li> <li>• uses the heading marker switch correctly during watch keeping.</li> </ul> <p><b>2.4</b> Takes ranges and bearings using the electronic bearing line (EBL) and variable range markers.</p> <p><b>2.5</b> Understands the errors in range and bearing.</p> <p><b>2.6</b> Understands the use of the offset electronic range and</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>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>bearing line (ERBL).</p> <p><b>2.7</b> Understands parallel indexing techniques:</p> <ul style="list-style-type: none"> <li>• understands the methods of parallel indexing using index lines</li> <li>• sets up index lines correctly.</li> </ul> <p><b>2.8</b> Correctly interprets the information supplied by the radar.</p> <p><b>2.9</b> Displays and interprets relative and true tracks correctly.</p> <p><b>3. Radar Plotting</b></p> <p><b>3.1</b> Understands the method of laying out a paper plot:</p> <ul style="list-style-type: none"> <li>• the Plotting Triangle (WOA Triangle)</li> <li>• understands CPA, and</li> <li>• TCPA and method of calculating the true target track.</li> </ul> <p><b>3.2</b> Interprets plotted information correctly and acts according to IRCPS.</p> <p><b>3.3</b> Understands the effects of alteration of course and/or speed of own ship.</p> <p><b>3.4</b> Demonstrates the effect of an alteration of course and/or speed for a critical target on the CPAs of other ships.</p> <p><b>4. ARPA (Note: The term 'ARPA' includes 'Target Tracking')</b></p> <p><b>4.1</b> IMO Performance standards for ARPA:</p> <ul style="list-style-type: none"> <li>• an appreciation of the performance standards in particular the standards relating to accuracy.</li> </ul> <p><b>4.2</b> Factors affecting system performance and accuracy:</p>		

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	<ul style="list-style-type: none"> <li>• knowledge of ARPA sensor input parameters- radar, compass and speed inputs and the effects of sensor malfunction on the accuracy of ARPA data</li> <li>• knowledge of:                             <ul style="list-style-type: none"> <li>– 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</li> <li>– factors which influence vector accuracy.</li> </ul> </li> </ul> <p><b>4.3 Tracking capabilities and limitations:</b></p> <ul style="list-style-type: none"> <li>• knowledge of:                             <ul style="list-style-type: none"> <li>– criteria for the selection of targets by automatic acquisition</li> <li>– factors leading to the correct choice of targets for manual acquisition</li> <li>– effects on tracking of lost targets and target fading</li> <li>– circumstances causing ‘target swap’ and its effects on displayed data, and</li> <li>– the limits imposed on both types of acquisition in multi-target scenarios.</li> </ul> </li> </ul> <p><b>4.4 Processing delays:</b></p> <ul style="list-style-type: none"> <li>• knowledge of:                             <ul style="list-style-type: none"> <li>– the delays inherent in the display of processed ARPA information, particularly on acquisition and re-acquisition or when a</li> </ul> </li> </ul>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>tracked target, or own ship, manoeuvres.</p> <p><b>4.5</b> Operational warnings:</p> <ul style="list-style-type: none"> <li>• appreciation of:                             <ul style="list-style-type: none"> <li>– the uses, benefits and limitations of ARPA operational warnings and their correct setting, where applicable, to avoid spurious alarms and distraction.</li> </ul> </li> </ul> <p><b>4.6</b> True and Relative vectors and typical graphic representation of target information and danger areas:</p> <ul style="list-style-type: none"> <li>• thorough knowledge of true and relative vectors, derivation of targets' true courses and speeds including:                             <ul style="list-style-type: none"> <li>– 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</li> <li>– effects of alteration of course and/or speed of own ship and/or targets on predicted closest point of approach and predicted time to closest point of approach and danger areas</li> <li>– effects of incorrect vectors and danger areas</li> <li>– benefits of switching between true and relative vectors.</li> </ul> </li> </ul> <p><b>4.7</b> Information on past positions of targets being tracked</p> <ul style="list-style-type: none"> <li>• knowledge of:                             <ul style="list-style-type: none"> <li>– the derivation of past positions of targets</li> </ul> </li> </ul>		

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	<p>being tracked</p> <ul style="list-style-type: none"> <li>– 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.</li> </ul> <p><b>4.8</b> Setting up and maintaining displays:</p> <ul style="list-style-type: none"> <li>• ability to demonstrate: <ul style="list-style-type: none"> <li>– selection of display presentation; stabilised relative motion displays and true motion displays</li> <li>– correct adjustment of all variable radar display controls for optimum display of data</li> <li>– selection as appropriate of required speed input</li> <li>– selection of ARPA tracking controls, manual automatic acquisition, vector/graphic display of data</li> <li>– selection of the time scale of vectors/graphics</li> <li>– use of exclusion areas when automatic acquisition is utilized</li> <li>– performance checks of radar, compass and speed input sensors and ARPA.</li> </ul> </li> </ul> <p><b>4.9</b> Obtaining information from the ARPA display:</p> <ul style="list-style-type: none"> <li>• ability to obtain information in both relative and true modes of display, including:</li> </ul>		

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	<ul style="list-style-type: none"> <li>– identification of critical echoes</li> <li>– speed and direction of target's relative movement</li> <li>– time to and predicted range at target's closest point of approach</li> <li>– courses and speeds of targets</li> <li>– detecting changes of targets' courses and speeds and the limitations of such information</li> <li>– effect of changes in own ship's course or speed or both</li> <li>– operation of the trial manoeuvre, and</li> <li>– use and limitations of the mapping facility.</li> </ul> <p><b>4.10</b> Application of the International Regulations for Preventing Collision at Sea:</p> <ul style="list-style-type: none"> <li>• 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 Preventing Collision at Sea.</li> </ul>		
<p><b>Use of ECDIS to maintain the safety of navigation</b></p> <p><b>Note:</b> Training and assessment</p>	<p><b><i>Navigation using ECDIS</i></b></p> <p><b>1. Electronic Chart Display and Information systems</b></p> <p><b>1.1</b> Understands the difference between ECS and ECDIS.</p> <p><b>1.2</b> Understands the principal types of electronic charts</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved training</li> </ul>	<p>Monitors information on ECDIS in a manner that contributes to safe navigation</p>

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<p>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 concerned</p>	<p>available:</p> <ul style="list-style-type: none"> <li>• raster charts</li> <li>• vector charts</li> <li>• be aware of S-52 and S-57 IHO performance standards</li> <li>• be aware of the significance of ENC and their use with ECDIS.</li> </ul> <p><b>1.3</b> Basic navigational functions and settings.</p> <p><b>1.4</b> Specific functions of route monitoring.</p> <p><b>1.5</b> Radar and ARPA and AIS overlays.</p> <p><b>1.6</b> Status indications, indicators and alarms.</p> <p><b>1.7</b> Integrity monitoring.</p> <p><b>1.8</b> Risk of over reliance on ECDIS.</p> <p><b>1.9</b> Awareness of updating and correcting ECDIS chart.</p> <p><b>1.10</b> Awareness of backup systems in event of ECDIS failure.</p> <p><b>2. Understands the display of the ship position symbol on ECS:</b></p> <p><b>2.1</b> DGPS and Loran-C etc.</p> <p><b>2.2</b> Understands the potential errors due to incorrect chart datum.</p> <p><b>2.3</b> Understands the limitations of accuracy.</p>	<p>ship experience</p> <ul style="list-style-type: none"> <li>• Approved ECDIS simulator training</li> </ul>	<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 maintained through adjustments made to the ship's course and speed through ECDIS-controlled track-keeping functions (when</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
			fitted) Communication is clear, concise and acknowledged at all times in a seaman like manner
<b>Respond to emergencies</b>	<p><b><i>Emergency procedures:</i></b></p> <p><b>1. Response to emergencies</b></p> <p><b>1.1</b> Precautions for the protection and safety of passengers in emergency situations.</p> <p><b>1.2</b> Initial action to be taken following:</p> <ul style="list-style-type: none"> <li>• collision</li> <li>• grounding</li> <li>• flooding, and</li> <li>• major mechanical damage.</li> </ul> <p>Including initial damage assessment, control of situation and protection of the marine environment</p> <p><b>1.3</b> Appreciation of the procedures to be followed for:</p> <ul style="list-style-type: none"> <li>• rescuing persons from the sea</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved in-service experience</li> <li>• Approved training ship experience</li> <li>• Approved simulator training, where appropriate</li> <li>• Practical training</li> </ul>	<p>The type and scale of the emergency is promptly identified</p> <p>Initial actions and, if appropriate, manoeuvring of the ship are in accordance with contingency plans and are appropriate to the urgency of the situation and nature of the emergency</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<ul style="list-style-type: none"> <li>• assisting a vessel in distress, and</li> <li>• responding to emergencies which arise in port.</li> </ul>		
<b>Respond to a distress signal at sea</b>	<p><b><i>Search and rescue</i></b></p> <p><b>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 world-wide</b></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>
<b>Use the IMO Standard Marine communication Phrases and use English in written and oral form</b>	<p><b><i>English Language</i></b></p> <p><b>1. Adequate knowledge of the English language to enable the officer to:</b></p> <ul style="list-style-type: none"> <li>• use charts and other nautical publications</li> <li>• understand meteorological information</li> <li>• understand messages concerning ships safety and operation</li> <li>• communicate with other ships, coast stations and VTS centers</li> <li>• enable the officer to perform his/her duties with a multilingual crew, and</li> <li>• ability to understand the IMO Standard Marine</li> </ul>	<p>Examination and assessment of evidence obtained from practical instruction</p>	<p>English language nautical publications and messages relevant to the safety of the ship are correctly interpreted or drafted</p> <p>Communications are clear and understood</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	Communication Phrases (IMO-SMCP).		
<b>Transmit and receive information by visual signalling</b>	<p><b>Visual signalling</b></p> <p><b>1. Ability to use the International Code of Signals</b></p> <p><b>1.1</b> Ability to transmit and receive, by Morse light, distress signal SOS as specified in Annex IV of the International Regulations for Preventing Collisions at Sea, 1972, as amended, and ability to identify the remaining distress signals listed in annex IV.</p> <p><b>1.2</b> Understands the use of the International Code of Signals.</p>	Assessment of evidence obtained from practical instruction and/or simulation	Communications within the operator's area of responsibility are consistently successful
<b>Manoeuvre the ship</b>	<p><b>Ship manoeuvring and handling</b></p> <p><b>1. Manoeuvre the ship</b></p> <p><b>1.1</b> 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> <p><b>1.2</b> Use and care of mooring lines and other equipment.</p> <p><b>1.3</b> 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><b>1.4</b> Action in the event of failure of bridge control, telegraph or</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved in-service experience</li> <li>• Approved training ship experience</li> <li>• Approved simulator training, where appropriate</li> </ul>	<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 navigation</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>steering gear, and emergency steering arrangements.</p> <p><b>1.5</b> Procedures for anchoring.</p> <p><b>1.6</b> The effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances</p> <p><b>1.7</b> The effects of wind and current on ship handling.</p> <p><b>1.8</b> Manoeuvres and procedures for the rescue of persons overboard.</p>	<ul style="list-style-type: none"> <li>• Approved training on a manned scale ship model, where appropriate</li> </ul>	

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

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Ensure compliance with pollution-prevention requirements</b></p>	<p><b><i>Prevention of pollution of the marine environment and anti-pollution procedures</i></b></p> <p><b>1. Understanding of the MARPOL regulations</b></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 international port regulations.</p> <p><b>2. Pollution Prevention Requirements</b></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 of pollutants</p> <p>2.2 Basic understanding of the SOPEP manual, Garbage Management Plan and anti-pollution equipment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved in-service experience</li> <li>• Approved training ship experience</li> <li>• Approved training</li> </ul>	<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>
<p><b>Maintain seaworthiness</b></p>	<p><b><i>Ship stability</i></b></p> <p><b>1. Understands basic principles of hydrostatics and</b></p>	<p>Examination and assessment of evidence obtained from</p>	<p>The stability conditions comply with the IMO</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>of the ship</b></p>	<p><b>related terms</b></p> <p><b>1.1</b> Defines density and relative density and explains the use of the marine hydrometer.</p> <p><b>1.2</b> States the Law of flotation.</p> <p><b>1.3</b> Defines light displacement, load displacement, deadweight, buoyancy, reserve buoyancy.</p> <p><b>1.4</b> States that Displacement=Underwater volume x density.</p> <p><b>1.5</b> Calculates the displacement of a box shaped vessel for a given draught and relative density.</p> <p><b>1.6</b> Calculates the draught and freeboard for a boxed shaped vessel given the displacement and relative density.</p> <p><b>1.7</b> Is aware of the information given in the hydrostatic data relating to displacement, TPC and KM scales only.</p> <p><b>1.8</b> Extracts the displacement, TPC and KM from the hydrostatic data for a given mean draught using graphical and tabulated format.</p> <p><b>1.9</b> Calculates the displacement, change in draught and GM from the tabulated hydrostatic data.</p> <p><b>2. Understands the concept of initial stability</b></p> <p><b>2.1</b> Defines centre of gravity, centre of buoyancy, transverse metacenter, metacentric height, righting lever and righting moment.</p>	<p>one or more of the following:</p> <ul style="list-style-type: none"> <li>• Approved in-service experience</li> <li>• Approved training ship experience</li> <li>• Approved simulator training, where appropriate</li> <li>• Approved laboratory equipment training</li> </ul>	<p>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><b>2.2</b> 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 metacentre.</p> <p><b>2.3</b> States that righting moment (RM) = GZ x displacement.</p> <p><b>2.4</b> Explains the concept of the metacentric height (GM) as an assessment of initial stability.</p> <p><b>2.5</b> Describes the motion of stiff and tender vessels and states their advantages and disadvantages.</p> <p><b>2.6</b> Using a simple diagram, explains the difference between stable, neutral and unstable equilibrium with reference to GM.</p> <p><b>2.7</b> Describes the effect on GM due to adding, removing and transferring weights including fuel and water, and retention of water on deck.</p> <p><b>2.8</b> Explains the effect on GM of suspended weights.</p> <p><b>2.9</b> 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><b>3. Seaworthiness of the ship</b></p> <p><b>3.1</b> Understand fundamentals of watertight integrity, and the closing of all openings including hatches, access hatches</p>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>and watertight doors.</p> <p><b>3.2</b> Preparation for heavy weather.</p> <p><b>3.3</b> Describe the effect on stability of:</p> <ul style="list-style-type: none"> <li>• raising and lowering weights</li> <li>• low freeboard</li> <li>• obstruction of deck freeing arrangements and scuppers</li> <li>• slack tanks.</li> </ul> <p><b>4. Understands the precautions in preparing a vessel for sea</b></p> <p><b>4.1</b> Explains the importance of the completion of pre-sailing check-lists.</p> <p><b>4.2</b> Explains the importance of maintaining watertight integrity including the fitting of storm shutters.</p> <p><b>4.3</b> Explains the requirement to secure heavy or bulky items e.g. tenders, jet-skies and helicopters.</p> <p><b>4.4</b> Explains the importance of maintaining access to emergency equipment at all times.</p> <p><b>4.5</b> Is aware of importance of draining swimming pools.</p>		
	<p><b><i>Ship construction</i></b></p> <p><b>1. Understands ship construction terminology</b></p> <p><b>1.1</b> Explains and illustrates the following terms:</p> <ul style="list-style-type: none"> <li>• forward perpendicular</li> </ul>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<ul style="list-style-type: none"> <li>• after perpendicular</li> <li>• length between perpendiculars</li> <li>• length overall</li> <li>• amidships</li> <li>• beam</li> <li>• depth</li> <li>• freeboard</li> <li>• camber</li> <li>• sheer</li> <li>• flare</li> <li>• centre line, and</li> <li>• transverse cross section.</li> </ul> <p><b>1.2</b> 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><b>1.3</b> Explains the difference between measurement tonnage and displacement.</p> <p><b>2. Distinguishes between longitudinal, transverse and local stresses due to static and dynamic loading</b></p> <p><b>2.1</b> Explains the causes of longitudinal stresses with reference to hogging and sagging.</p> <p><b>2.2</b> Explains the effects of dynamic stresses with reference to wave action and loading.</p> <p><b>2.3</b> Explains the hull stresses caused by a sailing boat's mast</p>		

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	<p>and rigging and the stresses and loads present in the rig.</p> <p><b>2.4</b> Explains how local stresses arise due to panting, pounding, vibration, discontinuities at hull openings and local loading.</p> <p><b>2.5</b> 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 axis and significance of material disposal furthest from this plane.</p> <p><b>2.6</b> Explains the causes of transverse stresses with reference to dry docking and racking.</p> <p><b>3. Understands methods of yacht construction</b></p> <p><b>3.1</b> Is aware that the bottom, side shell and upper deck structure are important strength members.</p> <p><b>3.2</b> 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><b>3.3</b> Describes and illustrates the following terms:</p> <ul style="list-style-type: none"> <li>• centre girder</li> <li>• side Girder</li> <li>• stringers</li> <li>• transverse bulkheads</li> <li>• transverse frames</li> <li>• beams</li> <li>• beam knee</li> <li>• floors</li> </ul>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<ul style="list-style-type: none"> <li>• pillars</li> <li>• coamings, and</li> <li>• insert plates.</li> </ul> <p><b>3.4</b> Draws mid-section sketches of sail and motor yachts and identifies and explains the function of the principal components given in .3 3 above.</p> <p><b>3.5</b> Discusses the advantages and disadvantages of wood, steel, aluminium alloy, and Fibre Reinforced Plastic (FRP) and other composite systems used in yacht construction.</p> <p><b>3.6</b> Explain common defects found in FRP hull construction (osmosis and the damage that might arise).</p> <p><b>4. Understands plans normally carried on board</b></p> <p><b>4.1</b> Describes the contents of a general arrangement drawing.</p> <p><b>4.2</b> Describes the types of structural drawings that are normally available onboard and can identify the principal components listed 3 3 above.</p> <p><b>5. Understands the cause and prevention of chemical and galvanic corrosion</b></p> <p><b>5.1</b> Outlines the process of chemical corrosion (e.g. acids and alkalis).</p> <p><b>5.2</b> Describes the process of galvanic corrosion between dissimilar metals by explaining the electro chemical cell.</p> <p><b>5.3</b> Identifies areas prone to galvanic corrosion and explains and illustrates methods of joining dissimilar metals and fittings.</p> <p><b>5.4</b> Explains the function of a paint system in the prevention of</p>		

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	<p>corrosion and the importance of its proper maintenance</p> <p><b>5.5</b> Describes the process of preparing steel and aluminium plate for paint application.</p> <p><b>5.6</b> Outlines the principle of cathodic protection using sacrificial anodes and impressed current systems.</p> <p><b>6. Understands the functions of classification societies</b></p> <p><b>6.1</b> States the role of the classification society.</p> <p><b>6.2</b> States the items that will receive special attention during dry dock and annual surveys.</p> <p><b>7. Understands load lines, reserve buoyancy and methods of damage control</b></p> <p><b>7.1</b> Defines the terms freeboard deck, superstructure deck, superstructure, assigned freeboard, weathertight and watertight.</p> <p><b>7.2</b> States the purpose of the Load Line and is able to sketch an 'all seasons ' Load Line.</p> <p><b>7.3</b> Defines FWA and states that the FWA =1/48th Summer.</p> <p><b>7.4</b> Explains the importance of reserve buoyancy and the necessity for maintaining its integrity.</p> <p><b>7.5</b> 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><b>7.6</b> Discusses the routine maintenance to ensure the efficiency of closing arrangements for the items listed in .7</p>		

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	<p>5.</p> <p><b>7.7</b> Explains the importance of non-return valves on tank vent pipes especially when fitted low down on a vessel.</p> <p><b>7.8</b> Describes water freeing arrangements, scuppers and freeing ports.</p> <p><b>8. Understands bilge-pumping arrangements</b></p> <p><b>8.1</b> Draws a simple bilge pumping diagram.</p> <p><b>8.2</b> Describes the following components: pump, strum box, mud box, screw down non-return valve, screw down valve, manifold, overboard discharge.</p> <p><b>8.3</b> 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><b>Prevent, control and fight fires on board</b></p>	<p><b><i>Fire prevention and fire-fighting appliances</i></b></p> <ol style="list-style-type: none"> <li><b>1. Ability to organize fire drills</b></li> <li><b>2. Knowledge of classes and chemistry of fire</b></li> <li><b>3. Knowledge of fire-fighting systems</b></li> <li><b>4. Knowledge of action to be taken in the event of fire, including fires involving oil systems</b></li> </ol>	<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</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
			<p>shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The order of 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</p>
<p><b>Operate life-saving appliances</b></p>	<p><b><i>Life saving</i></b></p> <p><b>1. 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</b></p>	<p>Assessment of evidence obtained from training and experience as set out in section A-VI/2, paragraphs 1 to 4</p>	<p>Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>and thermal protective aids</b></p>		<p>and conditions and comply with accepted safety practices and standards</p>
<p><b>Apply medical first aid on board ship</b></p>	<p><b><i>Medical aid</i></b></p> <p><b>1. 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</b></p>	<p>Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3</p>	<p>The identification of the probable cause, nature and extent of injuries or conditions is prompt, and treatment minimizes immediate threat to life</p>
<p><b>Monitor compliance with legislative requirements</b></p>	<p><b><i>Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment</i></b></p> <p><b>1. Legislative requirements</b></p> <p><b>1.1</b> Contents and use of Merchant Shipping Notices (MSNs), Marine Guidance Notes (MGNs), Marine Information Notes (MINs) and Annual Summary of Admiralty Notices to Mariners.</p> <p><b>1.2</b> Knowledge and application of relevant Health and Safety legislation and the Code of Safe Working Practices for</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>Merchant Seamen including:</p> <ul style="list-style-type: none"> <li>• have an outline knowledge of the content of COSWP</li> <li>• understands the precautions to be observed when using lifting equipment</li> <li>• explains the requirement to use certified chains, shackles, strops and slings</li> <li>• describes the care, maintenance and records of such equipment</li> <li>• states the need for retesting of equipment to maintain validity of certificates</li> <li>• understands the significance of the terms Safe Working Loads and Breaking Strains</li> <li>• understand selection, care and maintenance of wires and ropes of all types</li> <li>• explains the correct procedure for inspecting a rope or wire for the effects of damage in order to ascertain its safety</li> <li>• describes the care of synthetic and natural fibre ropes and in particular the factors that affect strength</li> <li>• 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</li> <li>• anchoring: <ul style="list-style-type: none"> <li>– Explains the precautions necessary for clearing away the anchors for use</li> </ul> </li> </ul>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<ul style="list-style-type: none"> <li>– Explains the importance of communications</li> <li>– Explains the precautions to be taken before letting go the anchor</li> <li>– States the difference between self-stowing and non self-stowing anchor chain</li> <li>• mooring:                             <ul style="list-style-type: none"> <li>– explains the correct use of rope and chain stoppers</li> <li>– states the dangers of excessive loads on the mooring ropes and the dangers involved should a rope part, with particular reference to snap back zones</li> <li>– explains the correct procedure for securing to a mooring buoy</li> </ul> </li> <li>• towing:                             <ul style="list-style-type: none"> <li>– Understands the precautions to be observed when passing and connecting a towline to another vessel</li> <li>– Understands the precautions to be observed when rigging stages or bosun’s chairs aloft or overside</li> <li>– Understands the importance of Risk Assessments and the correct completion of Permits to Work</li> <li>– Understands the precautions to be observed if involved in an Enclosed Space entry.</li> </ul> </li> </ul> <p>1.3 Basic knowledge of relevant IMO conventions concerning</p>		

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>safety of life at sea, and protection of the marine environment.</p> <p><b>1.4</b> Purpose and application of the International Safety Management (ISM) Code and other applicable safety management systems in New Zealand and World-Wide.</p> <p><b>1.5</b> Purpose of Flag and Port State Control.</p> <p><b>1.6</b> Purpose and application of the International Ship and Port Security (ISPS) Code.</p> <p><b>1.7</b> Understands the content and application of the applicable codes including the Large Commercial Yacht Code (LY3).</p> <p><b>1.8</b> Knowledge of the requirements for musters and drills including fire, emergency and abandon ship drills.</p> <p><b>1.9</b> Understand the legal obligation to ensure a seaworthy vessel.</p> <p><b>1.10</b> A basic understanding of the laws of salvage.</p> <p><b>1.11</b> Understanding the requirements for safe manning, hours of work and Watchkeeping.</p> <p><b>1.12</b> Understand the circumstances when a vessel requires a crew agreement.</p>		
<p><b>Application of leadership and teamworking</b></p>	<p><b><i>Working knowledge of shipboard management and training; a knowledge of related international maritime conventions and recommendations, and national</i></b></p>	<p>Assessment of evidence obtained from one or more of the</p>	<p>The crew are allocated duties and informed of expected</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>skills</b></p>	<p><b>legislation</b></p> <p><b>1. Ability to apply task and workload management, including</b></p> <p>1.1 Planning and co-ordination.</p> <p>1.2 Personnel assignment.</p> <p>1.3 Time and resource constraints.</p> <p>1.4 Prioritisation.</p> <p><b>2. Knowledge and ability to apply effective resource management:</b></p> <p>2.1 Allocation, assignment and prioritisation of resources.</p> <p>2.2 Effective communication onboard and ashore.</p> <p>2.3 Decisions reflect consideration of team experiences.</p> <p>2.4 Assertiveness and leadership, including motivation.</p> <p>2.5 Obtaining and maintaining situational awareness.</p> <p><b>3. Knowledge and ability to apply decision-making techniques:</b></p> <p>3.1 Situation and risk assessment.</p> <p>3.2 Identify and consider generated options.</p> <p>3.3 Selecting course of action.</p>	<p>following:</p> <ul style="list-style-type: none"> <li>• approved training</li> <li>• approved in-service training</li> <li>• practical demonstration</li> </ul>	<p>standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>3.4</b> Evaluation of outcome effectiveness.</p>		<p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel status and operational status and external environment</p> <p>Decisions are most effective for the situation</p>
<p><b>Contribute to the safety of personnel and ship</b></p>	<p><b>1. Knowledge of personal survival techniques</b></p> <p><b>2. Knowledge of fire prevention and ability to fight and extinguish fires</b></p>	<p>Assessment of evidence obtained from approved training and experience as set out in section A-V1/1,</p>	<p>Appropriate safety and protective equipment is</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>3. Knowledge of elementary first aid</b></p> <p><b>4. Knowledge of personal safety and social responsibilities</b></p>	<p>paragraph 2</p>	<p>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> <p>Initial and follow-up action on becoming aware of an emergency conforms with established emergency response procedures</p>