

Part 2AA: Draft Amendments to Code for South African Maritime Qualifications

Part 2AA **Draft Amendment to the Code
for South African Maritime
Qualifications: Study matrices
and syllabuses for fishing and
marine motorman
qualifications**

STUDY MATRICES AND SYLLABUSES

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- Workshop Training

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STUDY MATRICES

FISHING CERTIFICATION (DECKDEPARTMENT)

(Subject modules and ancillary certification shown under certification columns)

Certification Subject etc	Unlimited Waters Command Endorsement	Skipper (Fishing ≥ 24 metres)	Skipper (Fishing < 24 metres) / Deck Officer (Fishing ≥ 24 metres)	Deck Officer (Fishing < 24 metres)	Able Seaman (Fishing)
Chartwork	1-5	1-4	1-3	1	—
Celestial Navigation	1	—	—	—	—
Electronic Navigation Systems	1-2	1-2	1-2	1	—
Naval Architecture	1-5	1-5	1-4	1-2	—
Shlp's Power Plant	1	1	1	—	—
Personnel Management and Ship Business	1-6	1-6	1-2 and 6	1	—
Meteorology	1-2	1	1	—	—
Ship Manoeuvring and Handling	1-2	1-2	1	—	—
Fishing Safety	1-2	1-2	1-2	1	1-2
Emergency Procedures	1-2	1-2	1-2	1	—
Communications	2	1	1	1	—
Proficiency in Survival Craft Local	X	X	X	—	X
Proficiency in Life Rafts	—	—	—	X	—
First Aid at Sea	—	—	X	X	X
Ship Captain's Medical Training	X	X	—	—	—
Fire-fighting	X	X	X	X	X
Advanced Fire- fighting	X	X	X	X	—
Re-sea Training	—	—	X	X	X
Radio Telephony	—	X	X	X	—
MDSS	X	—	—	—	—
Medical certificate	X	X	X	X	X
Visual Certificate	X	X	X	X	X

*Part 2AA: Draft Amendments to Code for South African Maritime Qualifications***MARINE MOTORMAN / CHIEF ENGINEER OFFICER (FISHING)
CERTIFICATION**

(Subject modules and ancillary certification shown under certification columns)

Certification Subject etc	Marine Motorman Grade 2	Marine Motorman Grade 1	Marine Motorman Higher Grade	Chief Engineer Officer (Fishing)
Naval Architecture	—	1-2	1-4	—
Personnel Management and Ship Business	1	1-3	1-4	—
Engineering Knowledge	1	1-2	3	—
Emergency Procedures	1	1	1-2	1-2
Fishing Safety	—	1-2	—	1-2
Electrotechnology	—	—	—	1
Applied Marine Science	—	—	—	1
Drawings	—	—	—	1
General Engineering Science/Applied Mechanics	—	—	—	1
Heat Engines / Thermodynamics	—	—	—	1-2
Proficiency in Survival Craft (Local)	—	—	X	X
Proficiency in Liferrafts	X	X	—	—
First Aid at Sea	X	X	X	X
Fire-fighting	X	X	X	X
Advanced Fire-fighting	—	—	X	X
At-sea Training	X	X	—	—

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WORKSHOP TRAINING
(MARINE MOTORMAN AND CHIEF ENGINEER OFFICER (FISHING))

(Subject modules shown under certification columns)

Subject	Certification	Marine Motorman Grade 1	Marine Motorman Higher Grade	Chief Engineer Officer (Fishing)
Diesel		—	1	1-2
Electrical		—	1	1-2
Fitting		—	1	1-2
Machining		—	1	1-2
Welding		1	—	—
Sheet metal		1	—	—
Hydraulics		1	—	—
Pneumatics		1	—	—
Refrigeration		1	—	—

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SYLLABUSES

CHARTWORK (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
<p>Plan and conduct a safe coastal passage</p>	<p>1 Ability to determine the ship's position on a chart by the use of:</p> <ol style="list-style-type: none"> .1 latitude and longitude. .2 simultaneous cross bearings (using compass, true or gyro bearings), transit bearings, by bearing and range, multiple ranges and relative bearings. .3 positional information from aids to navigation, including lighthouse, beacons, buoys and electronic navigation systems or by any use of the above. .4 dead reckoning, taking into account estimated speed. <p>2 Understands the terms "Deviation" and "Variation".</p> <p>3 Ability to determine safe courses between two positions on a chart and converting true courses into magnetic and compass courses and vice versa and making due allowance for Gyro error.</p> <p>4 Ability to monitor a passage along a planned route.</p> <p>5 Determining an ETA taking into account speed.</p> <p>6 Ability to demonstrate thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, especially annexes II and IV concerned with safe navigation.</p> <p>7 Ability to demonstrate knowledge of keeping a navigational watch as prescribed in the STCW-F Convention.</p>	<p>By oral Examination, completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1 approved in-service experience 2 approved training ship experience 3 approved simulator training, where appropriate 4 approved laboratory equipment training. <p>Using, amongst others, chart catalogues, charts (including latitude and pilot charts), deviation tables, navigational publications, radio navigational warnings, azimuth mirror, electronic navigation equipment, echo sounding equipment, compass, gyro compass, tide tables.</p> <p>Note: (i) ECDIS systems are considered to be included under the term "charts"</p> <p>(ii) The charts, notices to mariners and tide tables used at this level are those published by the Hydrographer of the SA Navy.</p> <p>Thorough knowledge of collision regulations by oral exams and use of small models displaying proper signals or lights or by the use of a navigation light simulator. Thorough knowledge of keeping a navigational watch as detailed in Chapter IV of the STCW-F Convention.</p>	<ol style="list-style-type: none"> 1 The information obtained from navigational charts and publications is relevant, interpreted correctly and properly applied. All potential navigational hazards are accurately identified 2 The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions. 3 The reliability of the information obtained from the primary methods of position fixing is checked at appropriate intervals. 4 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. 5 The degree of precision required: <ol style="list-style-type: none"> .1 work to a degree of precision consistent with the data available and the type of problem in question taking into account the limits of acceptable instrument/system errors. .2 information from tables is to be extracted as accurately as possible consistent with the inherent accuracy of the tables, and final answers are to be given to the best degree of precision that is justified. .3 Ship's position is to be given within a maximum of one half of a nautical

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CHARTWORK (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 2			
1 Plan and conduct a safe coastal passage	1 Ability to determine a safe course when: .1 approaching a harbour, bay, river mouth or safe anchorage; and .2 making a land fall in thick and clear weather.		.4 in the calculation of compass errors, bearings and courses, the answer is to be given to the nearest whole degree. .5 tidal calculations are required to be within 15cm of a precise result.
2 Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ship's routing information	2 Ability to determine compass error, deviation and/or gyro error using transit bearings.		
3 Ability to maintain navigational charts and nautical publications from information contained in notice to mariners	3 Ability to plan a coastal passage and entry into harbour.		
4 Understand the broad principles and use of conventional magnetic and Gyro compasses	4 Dead reckoning, taking into account winds, tides, current and estimated speed.		
		As for module 1, using, in addition to the items described in module 1, the LALA buoyage system.	As for module 1.

CHARTWORK (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 3			
Plan and conduct a safe coastal passage	<ol style="list-style-type: none"> 1 Ability to determine, the effect of current and leeway on course and speed, the course to steer to make good a certain track (making due allowance for current and leeway), the set and rate of a current and the distance at which the ship will pass off a given point. 2 Ability to determine the compass error and deviation using the bearing of the sun at any time. 3 Ability to determine and use dipping distances of lights and distances of sighting points of land of known height. 4 Ability to determine the time and height of height and low water at Ports using South African Tide Tables. 5 Ability to determine the time the tide reaches a specified height or the height of a tide at a given time using tables and tide curves. 6 Ability to determine and use nautical tables to find courses and distances between two positions by Mercator sailing method or traverse tables. 	As for module 1, using, in addition to the items described in module 1, South African Tide Tables and nautical tables (Noties or Burtons).	As for module 1.
MODULE 4			
Plan and conduct a safe passage	<p>Ability to determine:</p> <ol style="list-style-type: none"> 1 the time and height of high and low water using the South African Tide Tables, 2 the time the tide reaches a specified height or the height of a tide at a given time using tables and tide curves. 3 and thence the approximate correction to be applied to soundings or to chartered heights of shore objects. <p>Ability to determine the ship's position on a chart using:</p> <ol style="list-style-type: none"> 1 bearings of one or more objects with the run between allowing for a current. 2 position lines obtained by any method, including 	As for module 1, using, in addition to the items described in modules 1, 2 and 3, notices to mariners, tide tables and other navigational publications.	<ol style="list-style-type: none"> 1 As for module 1. 2 Organizing the bridge watch into the most effective team to afford the safest navigation for the ship.

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CHARTWORK (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>terrestrial position lines.</p> <p>3 Understand the siting of the magnetic compass with reference to proximity of magnetic material and electrical appliances and the precautions to be taken with electric wiring in the vicinity of the compass.</p>		
MODULE 5			
Plan and conduct a safe passage	<p>1 Ability to determine:</p> <p>.1 the time and height of high and low water using the Admiralty tide Tables Volumes I and II.</p> <p>.2 the time the tide reaches a specified height or the height of a tide at a given time using tables and tide curves.</p> <p>.3 and thence the approximate correction to be applied to soundings or to charted heights of shore objects.</p> <p>2 Ability to determine the ship's position on a chart using:</p> <p>.1 bearings of one or more objects with the run between allowing for a current.</p> <p>.2 position lines obtained by any method, including terrestrial and celestial position lines.</p> <p>3 Ability to determine the compass error and deviation using the bearing of celestial objects including the sun, moon, planets and stars as listed in the Nautical Almanac at any time.</p>	<p>As for module 1, using, in addition to the items described in modules 1, 2, 3 and 4, notices to mariners, tide tables and other navigational publications.</p>	<p>1 As for module 1.</p> <p>2 Organizing the bridge watch into the most effective team to afford the safest navigation for the ship.</p>

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CELESTIAL NAVIGATION (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Determine position	<p>1 Understands the terms poles, equator, meridians, parallels of latitude, difference of latitude, difference of longitude, departure, mean latitude, difference of meridional parts, and their use and the relationship between them.</p> <p>2 Ability to determine course and distance using the traverse method and/or plane and Mercator sailing.</p> <p>3 Understands the relationship between GMT, LMT, longitude, zone time and standard time.</p> <p>4 Ability to alter ship's time with change of longitude and rate a chronometer.</p> <p>5 Ability to determine:</p> <ol style="list-style-type: none"> .1 the latitude by meridian altitude of the Sun or Venus 2 from a sextant-observation of a heavenly body near or out of the meridian, the direction of the position line and a position through which it passes 3 the ship's position using position lines obtained from two or more celestial observations, with or without a run <p>6 Ability to use the sextant, determine its index error and reduce the index error to an acceptable error.</p> <p>7 Ability to pre-compute the approximate time (to the nearest minute) of the meridian passage of a heavenly body and the rising and setting times of the sun and the moon.</p>	<p>By written theoretical examination, completion of approved education and training and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1 approved in-service experience 2 approved training ship experience 3 approved simulator training, where appropriate 4 approved laboratory equipment training. <p>Using sextant, almanac, sight reduction tables, star identifier, navigational tables (Nories or Burtons), pocket scientific calculator.</p> <p>Note: (i) Heavenly body in this unit means the Sun, the Moon and stars listed in the nautical almanac. (ii) Air navigation tables are allowed to be used for star sights.</p>	<p>The degree of precision required:</p> <ol style="list-style-type: none"> 1 work to a degree of precision consistent with the data available and the type of problem in question taking into account the limits of acceptable instrument/system errors 2 information from tables is to be extracted as accurately as possible consistent with the inherent accuracy of the tables, and final answers are to be given to the best degree of precision that is justified 3 problems may be solved by any method, provided that such method is correct in principle and affords the required degree of precision 4 calculations used to obtain a position line are to be capable of giving an answer to within or maximum of one half of a nautical mile 5 when making calculations to obtain a ship's position, calculations are to be to 0,5 of a minute of arc and to the nearest second of time.

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ELECTRONIC NAVIGATION SYSTEMS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
1 Use of echo sounders	1 Understands the basic principles of ship borne echo sounders. Types in use at sea. The principle components of general purpose echo sounding equipment. Precautions to be observed in use and accuracy to be expected	1 During the training establishment phase. Evidence obtained by attending an approved course or: .1 by written examination of the theoretical knowledge; and .2 by assessment of approved simulator training. 2 Using: .1 live and simulated radar, satellite navigator (GPS and DGPS), and electronic log; .2 Charts, equipment manuals and error diagrams/tables.	1 Information obtained from manuals and error diagrams/charts is correct, accurate and properly applied. 2 Positions are determined within the limits of acceptable instrument/systems errors. 3 Categorize the usefulness of the systems in terms of the areas - oceanic, landfall, coastal and estuarial. 4 Information obtained from radar is correctly interpreted and analysed taking into account the limitations of the equipment and prevailing circumstance and conditions. 5 Action to avoid a close encounter or collision with other vessels is timely and in accordance with the International Regulations for Preventing Collisions at Sea.
2 Use of GPS	2 Understands the basic principles of ship borne logs. Types in use at sea. The principle components of general purpose logs. Precautions to be observed in use and accuracy to be expected		
3 Use of GNSS	3 Understands and describes the basic principles of satellite navigation systems, typical receivers in use on board ships, corrections and expected accuracy, coverage areas, and differential systems.		
4 Operate basic radar equipment	4 Understands the basic principles of radar. Describes the basic radar installation. Identification of controls. Understand factors affecting performance and		

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ELECTRONIC NAVIGATION SYSTEMS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
5 Use radar for collision avoidance	Understands the principle and construction of a radar plot. Use of plot to obtain information about targets. Assessment of collision risk. Effect of alteration of courses and speed in relation to collision avoidance. Radar reporting procedures. Application of collision regulations in restricted visibility		
6 Use of radar as an aid to navigation	Able to detect and recognise fixed targets. Sources of error in positions obtained. Use of radar for navigation in confined and coastal waters using blind pilotage techniques.		
77 Use of electronic plotters/ECDIS as an aid to navigation	Understands and describes the basic principles of electronic plotters and ECDIS systems.		
MODULE 2			
Conduct a safe passage using radar	<p>Ability to operate and to interpret and analyse information obtained from radar, including the following:</p> <ol style="list-style-type: none"> 1 performance, including: <ol style="list-style-type: none"> .1 factors affecting performance and accuracy; .2 setting up and maintaining displays; .3 detection and misrepresentation of information, false echoes, sea return etc, racons and SARTs; and 2 use, including: <ol style="list-style-type: none"> .1 range and bearing; course and speed of other ships; time and distance of closest approach of crossing, meeting overtaking ships; .2 identification of critical echoes; detecting course and speed changes of other ships; effect of changes in own ship's course or 	<ol style="list-style-type: none"> 1 During the training establishment phase. Evidence obtained by attending an approved course or: <ol style="list-style-type: none"> .1 by written examination of the theoretical knowledge; and .2 by assessment of approved simulator training. 2 Using: <ol style="list-style-type: none"> .1 radar simulation; .2 charts, equipment manuals and error diagrams/tables; .3 the collision regulations, notices to mariners, marine notices, safety of navigation regulations, and radar performance specifications (IMO and marine notice); .4 case studies from courts of marine enquiry and MARS reports. As for 	<ol style="list-style-type: none"> 1 Information obtained from radar is correctly interpreted and analysed taking into account the limitations of the equipment and prevailing circumstance and conditions. 2 Action to avoid a close encounter or collision with other vessels is timely and in accordance with the International Regulations for Preventing Collisions at Sea.

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ELECTRONIC NAVIGATION SYSTEMS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	speed or both; .3 application of the International Regulations for Preventing Collisions at Sea; .4 plotting techniques and relative motion concepts; .5 blind pilotage techniques.	module 1.	

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Small vessel construction and stability	<p>1 Able to name the principal parts and fittings of a fishing vessel including: bow, stern, stern, bulwarks, hull, hatch, grid cooler, masts etc.</p> <p>2 Understands:</p> <p>.1 reasons for making the deck and superstructure watertight;</p> <p>.2 purpose of watertight bulkheads and the collision bulkhead;</p> <p>.3 reason for a hull survey, the items surveyed at the hull survey and the period between surveys for the issue of a local general safety certificate;</p> <p>.4 drawing the propeller shaft(s) and the opening of hull fittings and the period between the inspect of these items;</p> <p>.5 relationship between centre of gravity, centre of buoyancy and metacentric height;</p> <p>.7 conditions of:</p> <p>.1 stiff ship;</p> <p>.2 tender ship;</p> <p>.3 free surface effect and the dangers associated with them;</p> <p>.8 reasons for having efficient means of drawing water rapidly from the deck and the danger of water trapped on deck;</p> <p>.9 reasons for stowing heavy cargo items below and lighter items on top;</p> <p>.10 purpose of free board and reserve buoyancy;</p> <p>.11 meaning of the terms displacement, deadweight and gross tonnage.</p> <p>3 Knows the danger of stowing cargo on deck only with nothing below.</p>	<p>By oral examination, completion of approved education and training, written theoretical 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>1 The safe operating limits of the ship are not exceeded in normal operations.</p> <p>2 The ship is always properly stowed ensuring that she is always safe.</p> <p>3 Able to deliver clear and understandable reports issuing ship construction terminology.</p> <p>4 The ship is always securely battened down for proceeding to sea and severe weather conditions.</p> <p>5 Bilge pumping systems are properly operated.</p> <p>6 Fire mains are properly operated.</p>

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 2			
Basics of ship dimensions and form	1 Understands the names and principal parts of a ship. 2 Illustrates the general arrangement of common ship types found in the fishing fleet. 3 Describes by means of a diagram: .1 a bilge pumping system; .2 a fire main; .3 a steering system. 4 Understands the need to maintain the watertight integrity of the vessel and can describe the methods of maintaining the following: .1 hatch covers; .2 watertight doors; .3 sounding pipes and vents; .4 offal chutes; .5 scuppers and freeing ports.	As for module 1.	As for module 1.
	MODULE 3		
1 Flotation and displacement	1.1 Understands the relationship between the mass of a ship and the volume of water displaced by the hull form and that volume changes with change in mass of ship. 1.2 Defines: .1 displacement (light and load displacement); .2 deadweight. 1.3 Able to calculate the displacement of a ship. 1.4 Able to use: .1 displacement/draught curve; .2 deadweight curve/scale.	As for module 1.	As for module 1.
2 Buoyancy and reserve buoyancy	2.1 Describes: .1 buoyancy;		

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
3 Fundamental statical stability, assessment of initial stability and the curve of statical stability	<p>2 the relationship between force of buoyancy and displacement; 3 reserve buoyancy, its importance and the relationship between it and freeboard.</p> <p>3.1 Defines: centre of gravity; centre of buoyancy; metacentre; metacentric height; righting lever; righting moment.</p> <p>3.2 Describes: .1 stability as the ability of the ship to return to an upright position after being heeled by an external force; .2 how the value of GM is a useful guide to the stability of the ship; .3 with the aid of diagrams, a stable and unstable ship and the position of positive, negative and zero GM; .4 with the aid of diagrams, the relationship between the righting lever, righting moment for small and large angles of heel; .5 a capsizing moment; .6 angle of loll and rolling about an angle of loll; .7 ability to interpret various stability conditions from a stability book or a set of pre-calculated stability conditions.</p>		
4 Movement of the centre of gravity	<p>4 Describes, with the aid of diagrams, the movement of G when a mass is: - added (loaded) - removed (discharged) - moved within the ship - suspended (from a derrick hook).</p>		

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 4			
1 Construction of specific parts of hull structure	<p>1.1 Identifies the structural components of a ship's hull on ships' plans and drawings. Includes items such as frames, floors, beams, knees, brackets, shell plating, decks, bulkheads, pillars, hatch girders, coamings, butwarks, cant beams and breast hooks</p> <p>1.2 Identifies longitudinal, transverse and combined systems of framing on transverse sections of ships.</p> <p>1.3 Illustrates:</p> <ul style="list-style-type: none"> .1 double-bottom structure for longitudinal and transverse framing; .2 bilge structure; .3 different keel structures; .4 connection of superstructures to the hull at the ship's side <p>1.4 Sketches:</p> <ul style="list-style-type: none"> .1 different deck edge connections; .2 deck-freeing arrangements; .3 a plane and corrugated bulkhead, showing connections to deck, sides and double bottom and the arrangement of stiffeners. <p>1.5 Describes the stress concentration in the deck round hatch openings.</p> <p>1.6 Understands why transverse bulkheads have vertical corrugations and fore-and-aft bulkheads have horizontal ones.</p> <p>1.7 Explains compensation for loss of strength at hatch openings.</p> <p>1.8 Describes and illustrates:</p> <ul style="list-style-type: none"> .1 the purpose of bilge keels and how they are attached to the ship's side; .2 the provision of additional structural strength to withstand pounding and painting; 	As for module 1.	As for module 1.

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
<p>Z structure and attachment of various hull fittings</p>	<p>.3 function of the stern frame and stem; .4 the transom stern, showing the connections to the stern frame. 1.9 Understands why the shaft tunnel must be of watertight construction and how water is prevented from entering the engine-room if the tunnel becomes flooded. 2.1 Describes and sketches: .1 a fishing vessel's arrangements of modern weather-deck mechanical steel hatches; .2 showing how watertightness is achieved at the coamings and cross joints where applicable. 2.2 Sketches and describes typical forecastle mooring and anchoring arrangements including the leads of moorings, rollers, multi-angle, pedestal and Panama fairleads. 2.3 Describes: .1 winch to deck connection; .2 anchor handling and securing arrangements from hawse pipe to spurting pipe; .3 watertightness of spurting pipe; .4 construction of chain lockers and securing of cables; .5 construction and use of a cable stopper. 2.4 Describes and sketches: .1 the bilge pumping system of a fishing vessel with screw-down non-return suction valves, strum boxes and sounding pipe arrangements; .2 a bilge/ballast system in a fishing vessel and the necessity of fitting air pipes to ballast and fuel tanks; .3 a fire main and states what pumps may be used to pressurize it. 2.5 Describes and sketches: .1 modern rudders: semi balanced, balanced and</p>		

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	spade; 2 the connection of the rudder to the ship; 3 how the weight of the rudder is supported; 4 how watertight integrity is maintained about the stock/full.		
MODULE 5			
1 Movement of centre of gravity	1.1 Describes: .1 with the aid of diagrams, the movement of G when a mass is: - added (loaded); - removed (discharged); - moved within the ship; - suspended (from a derrick hook); 2 with the aid of diagrams, a stable and unstable ship and the position of neutral equilibrium (positive, negative and zero GM); 3 a "stiff" and "tender" ship; 1.2 Describes: .1 with the aid of diagrams, the relationship between stability, the righting lever and righting moment for small and large angles of heel lever (uses the positions of G, B, M and Z); .2 a capsizing moment. 1.3 Describes: .1 the angle of "loll" and the dynamics resulting in a zero moment at the angle of loll; .2 the potentially dangerous situation of a ship rolling about the angle of loll. 1.4 Able to: .1 identify and use: - cross curves (KN curves) - hydrostatic curves to determine the metacentre	As for module 1.	As for module 1.

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
2 Effect of slack tanks	<p>above the keel (KM)</p> <p>-determine the GM given the KG</p> <p>know the formula $GZ = KN - KG \sin \phi$;</p> <p>derive and draw a GZ curve for stable and initially unstable ships from KN curves;</p> <p>obtain from a given curve of statical stability:</p> <p>4.1 the maximum righting lever and the angle at which it occurs;</p> <p>4.2 the angle of vanishing stability;</p> <p>4.3 the range of stability;</p> <p>5 show how lowering the position of G increases all values of the righting lever and vice versa.</p> <p>1.5 Knows the statutory requirements for a fishing vessel.</p> <p>1.6 Calculates:</p> <p>.1 shift of G (horizontally and vertically) resulting from adding, removing, moving or suspending masses;</p> <p>.2 change in KG during a passage resulting from:</p> <p>2.1 consumption of fuel and stores;</p> <p>2.2 absorption of water by a deck cargo;</p> <p>2.3 accretion of ice on decks and superstructures given the masses and their positions.</p> <p>2.1 Shows, with the aid of a diagram, the effect on the centre of gravity (G) when the liquid in a partly filled tank moves during rolling (free surface effect).</p> <p>2.2 Knows:</p> <p>.1 that the increase in KG is affected mainly by the breadth of the free surface and is not dependent upon the mass of liquid in the tank;</p> <p>.2 what ship construction measures are taken to reduce the effects of free surface;</p> <p>.3 the procedure for ballasting tanks when the ship is at an angle of loll or when she has a small positive</p>		

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NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	GM. 2.3 Calculates the virtual loss in GM due free surface moments.		

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SHIP'S POWER PLANT (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
<p>Understand the working and operation of on board machinery and ship propulsion systems</p>	<p>1 Marine engineering terms: .1 Use the correct engineering terms when describing and explaining the operation of the machinery and equipment. .2 Explain what is meant by the efficiency of a machine. 2 Understand the construction and operation of the following: .1 Marine power plants <i>Diesel engines</i> .1.1 Describe the 4-stroke diesel engine. .1.2 Describe the methods of supercharging. .1.3 Describe the fuel oil system from bunker tank to injection. .1.4 Describe the lube oil system. .1.5 Describe the engine cooling-water systems. .1.6 Describe how a diesel engine is prepared for stand-by and starting. .1.7 Understand that the number of starts is limited by the capacity of the starting air reservoir. 2 Auxiliaries .2.1 Describe a domestic water system. .2.2 Pumps and pumping systems: .2.2.1 Classify pumps as displacement, axial-flow or centrifugal. .2.2.2 Explain the need to prime a centrifugal pump. .2.2.2 Explain net positive suction head .2.2.4 State that the engine-room emergency bilge suction is</p>	<p>A Oral examination and assessment of evidence obtained from theoretical instruction. B Oral examination and assessment of evidence obtained from practical experience gained through on board training.</p>	<p>Show sufficient knowledge to discuss intelligently with the Chief Engineer, matters relating to the running and maintenance of power plants and auxiliary machinery, complying with safe operating limits at all times.</p>

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SHIP'S POWER PLANT (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>3 Steering gears: .31 Describe an electric steering control system. .32 Explain how the change from remote to local control in the engine room is made.</p> <p>4 Generators, alternators and electrical distribution: .4.1 Describe the operation of generators. .4.2 Describe a navigation light circuit with indicators and alarms, showing an alternative power supply. .4.3 Describe the characteristics of lead-acid batteries and of alkaline batteries. .4.4 Describe the maintenance of batteries. .4.5 Describe the safety precautions to be observed for battery compartments. .4.6 Outline the starting requirements for emergency generating sets. .4.7 List the services to be supplied from the emergency generator.</p> <p>5 Oily-water separators and oil filtering equipment: .1 Describe the main purpose and operation of oily-water separators. .2 Describe how an oil-content meter functions. .3 Describe an oil discharge monitoring and control system.</p> <p>6 Deck machinery: .1 State that the design and performance of anchor windlasses is subject to approval.</p>		

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SHIP'S POWER PLANT (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>.2 Describe an anchor winch.</p> <p>.3 Describe a cargo winch.</p> <p>.4 Sketch and describe a slewing deck crane, its motors and its controls.</p> <p>.5 Describe the lubrication of deck machinery.</p> <p>.6 Describe a spooling device to distribute the wire evenly on the drum of a mooring winch.</p> <p>.7 Hydraulic systems:</p> <p>.1 State that a hydraulic system for deck machinery consists of an oil tank, pumps, control valves, hydraulic motors and pipework.</p> <p>.2 State that cooling of the hydraulic oil is necessary during an operation to maintain the correct viscosity of the oil.</p> <p>.3 State that the oil may need to be heated before starting from cold.</p> <p>.4 State that cleanliness of the oil is essential for a satisfactory operation and that all systems contain filters.</p> <p>.5 State that air in the system leads to erratic functioning.</p>		

Part 2AA: Draft Amendments to Code for South African Maritime Qualifications

PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
1 Take precaution to prevent pollution to the marine environment	<p>1 Knows:</p> <ol style="list-style-type: none"> 1.1 what to do in an emergency involving an oil spill on deck or in the engine-room; 1.2 the necessity of being aware at all times of preventing oils spills; 1.3 that it is prohibited to throw plastics overboard anywhere in the world; 1.4 that there are special areas (for the trade in which his/her ship is engaged) where certain pollutants may or may not be discharged overboard. <p>(Candidates will only be required to know that pollution regulations apply to ships.)</p>	By oral examination and completion of approved education and training and assessment during approved on board training.	<ol style="list-style-type: none"> 1.1 Is able to give a clear and concise oil spill report to a ship's officer. 1.2 Can assemble appropriate equipment to control an oil spill or pollution incident with special reference to quick response. 1.3 Containment of oil spill/pollution is achieved using appropriate procedures, techniques and equipment. 1.4 Organisational procedures designed to safeguard the marine environment are observed at all times.
2 Observe safe working practices	<ol style="list-style-type: none"> 2.1 Has a broad knowledge of the contents of the Code of Safe Working Practices for Fishermen. 2.2 Is aware that the maritime occupational safety regulations provide rules to assist all seafarers. 2.3 Knows and understands their importance. 2.4 Is aware that there is a safety officer on board the ship. 2.5 Knows that his/her superiors have a duty to ensure that work on board is performed to a high standard of occupational safety. 2.6 Knows the importance of adhering to safe working practices at all times. 2.7 Knows the safety and protective devices available to protect against possible hazards aboard a ship, including overalls, safety helmets, goggles, safety footwear and safety harnesses. 2.8 Knows the precautions to take before entering enclosed spaces, including the permit to work system, duties of 		<ol style="list-style-type: none"> 2.1 The requirements of the Code of Safe Working Practices for Fishermen have been observed. 2.2 Shows an understanding of contents thereof and has shown understanding of the basic safety requirements observed by seamen in their ordinary course of duty. 2.3 Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times.

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Maritime Qualification

PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
3	<p>Contribute to effective human relationship on board ship</p> <p>standby man and safe to work certificate.</p> <p>3 Understands:</p> <ol style="list-style-type: none"> .1 importance of maintaining good human and working relationships on board ship; .2 employment conditions, working hours and rest periods; .3 individual rights and obligations in terms of the disciplinary code and grievance procedures; .4 dangers of drug and alcohol abuse in terms of their effects to health and safety of others; .5 drug and alcohol policies as applied by shipping companies; .6 basic conditions and terms of his/her contract of employment. 		3 Expected standards of work and behaviour are observed at all times.
MODULE 2			
1	<p>Take effective action in the event of an oil spill or other pollution emergency</p> <p>1 Knows:</p> <ol style="list-style-type: none"> .1 the ship board contingency plan for an oil spill; .2 where the emergency oil spill locker is; .3 the equipment that will be found therein and what each item is for. 	As for module 1.	<p>1 Is able to:</p> <ol style="list-style-type: none"> .1 give a clear and concise oil spill report to a ship's officer; .2 assemble appropriate equipment to control an oil spill or pollution incident with special reference to quick response; .3 Contain an oil spill/pollution using appropriate procedures, techniques and equipment.
2	<p>Protection and preservation of the marine environment</p> <p>2 Knows the zones regarding the disposal of garbage and other waste at sea.</p>		2 Current pollution regulations are observed
3	<p>The maritime occupational safety regulations</p> <p>3.1 Has a working knowledge of the maritime occupational safety regulations and associated <i>Code of Safe Working Practices for Fishermen</i> and understanding of its</p>		<p>3.1 The requirements of the <i>Code of Safe Working Practices for Fishermen</i> have been observed.</p> <p>3.2 Shows an understanding of a contents thereof</p>

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PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
4.1 Personnel management on board ships	<p>3.2 Able to readily and effectively liaise with the vessel's safety officer.</p> <p>3.3 Knows that the master and ship's officers have a duty to ensure that all work on board is performed to a high standard of occupational safety.</p> <p>4.1 Knows the principles of controlling subordinates and maintaining good relationships.</p> <p>4.2 Able to lead, motivate and develop personnel.</p> <p>4.3 Able to exercise authority.</p> <p>4.4 Knows the conditions of employment and discipline and grievances procedure in which hearings are conducted.</p> <p>4.5 Has an understanding of general industrial relations.</p> <p>5 Knows how to organise staff and to allocate duties and tasks.</p> <p>6 Understands the importance of familiarisation and ongoing training at sea.</p> <p>7 Knows what procedure is required when assuming command after the death of the master or when the master is temporarily incapacitated.</p>		<p>and shows full understanding of all the various safety requirements required of seamen in the ordinary course of their duty.</p> <p>4.1 Applies the various factors affecting personnel management in ships.</p> <p>4.2 Maintains good relations on board ship.</p>
5 Organise staff			5 Organises staff tasks and duties.
6 Train subordinates on board			6 Aptitude to give good practical training to subordinates during the course of normal work on board the vessel.
7 Assume command in an emergency or on the demise of the master			7 Command capabilities with respect to maintaining a safe ship and a well managed.
MODULE 3			
1 Organisations concerned with shipping	1 Knows the basic legal implications of rules, regulations and codes emanating from such organisations as government agencies.	By oral examination, completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following:	1 International and flag state rules, regulations and codes are properly applied to the ship and cargo.

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PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
2 Protection and preservation of the marine environment	2.1 Knowledge of emergency pollution action and duties. 2.2 Shows full knowledge of the equipment in the emergency oil spill locker and how each item is used. 2.3 Knows what to do if called upon to rapidly organise an emergency team to tackle an oil spill/pollution hazard. 2.4 Has a working knowledge of the contents of the MARPOL Convention.	1 approved in-service experience; 2 approved training ship experience.	2.1 Rapidly assess an oil spill or pollution emergency. 2.2 Implement the shipboard emergency plan required by the current international pollution convention so as to preserve the marine environment.
3 Maritime occupational safety regulations	3 Has a working knowledge of contents and regulations of the maritime occupational safety regulations.		3.1 Maritime occupational safety regulations and associated <i>Code of Safe Working Practices for Fishermen</i> have been observed. 3.2 The various safety precautions required of seamen in the ordinary course of their duties are correctly observed and applied.
MODULE 4			
1 Manage personnel	1.1 At a skipper and chief engineer level: .1 organize and supervise training programmes; .2 lead, motivate and develop junior staff; .3 exercise authority; .4 allocate duties and tasks; .5 organise safety and emergency duties; .6 organise deck or engine room maintenance tasks; conduct: .7.1 staff performance evaluation; .7.2 disciplinary proceedings; .7.3 grievances hearings. 1.2 Know: .1 manning requirements on board ship;	As for module 3.	1 The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned.

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PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
2	<p>Responsibility under the master or chief engineer, for on board training of deck or engine-room staff as applicable</p> <p>2.1 Knows:</p> <ol style="list-style-type: none"> 1. Training methods; 2. training planning; 3. that training and assessment on board must be conducted, monitored, evaluated and supported by suitably trained persons. <p>2.2 Has an understanding of the STCW-F Convention.</p>	<p>2. contracts of employment between company/manning agency and crew;</p> <p>3. crews rights and responsibilities;</p> <p>4. principles of general industrial relations.</p> <p>1.3 Have an understanding of the requirements of local labour legislation as they affect ship's crews.</p>	<p>2 Effective ability to take charge of board training.</p>
MODULE 5			
1	<p>IMO Conventions and local regulations in respect of oil pollution prevention and safety equipment</p>	<p>1.1 General knowledge of the requirements of the life-saving equipment regulations and MARPOL Convention and the regulations concerning life-saving, fire-fighting appliances and oil pollution prevention.</p>	<p>1 Determine the safety, and oil prevention equipment required on board ship.</p>
2	<p>Protection and preservation of the marine environment</p>	<p>2.1 Knowledge of the chief mate's or second engineer's duties (as applicable) and ship's liability regarding pollution at sea and able to ensure that the crew are fully trained in emergency oil spill procedures and the oil pollution locker is fully equipped in accordance with requirements.</p> <p>2.2 Able to organise a rapid, effective response to an oil spill or other pollution emergency on board and knows the importance of conducting regular drills.</p>	<p>2 Action required to be taken after a spill of oil when chemicals or sewage waste are inadvertently dumped at sea so as to best preserve the marine environment.</p>
3	<p>Full knowledge of the maritime</p>	<p>3 Full knowledge of contents and implications of the</p>	<p>3 Chief mate's duties or second engineer's duties</p>

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PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
occupational safety regulations	maritime occupational safety regulations.		(as applicable) of ensuring that all crew members are suitably informed/instructed and carry out the requirements of the maritime occupational safety regulations.
MODULE 6			
1 Take command of a vessel on unlimited or limited voyages	1.1 Have a clear understanding of action to be taken on assuming command. 1.2 Knows the certificates and other documents required to be carried on board ships; their use, legal significance how they may be obtained, period of validity. 1.3 Knows the handover of command requirements.	As for module 3.	1 Ability to take over command with the legal implications thereof.
2 Relationship to pilot	2 Understand the relationship between master and pilot.		
3 Knowledge of statutory legal requirements for the official log book and appropriate sections of the <i>Merchant Shipping Act</i> .	3 Know: .1 official log book and the law relating to entries; .2 offences relating to misconduct, endangering the ship and against persons on board; .3 have a general knowledge of Chapter 4 of the <i>Merchant Shipping Act</i> (engagements, discharges, etc.).		2 Able to communicate and establish a working relationship with the pilot. 3 Can complete: .1 all entries in the official logbook correctly including entries regarding offences; .2 all sign on/sign off procedures correctly.
4 Manage the ship's personnel	4 Have knowledge of: .1 civil liability for certain offences; .2 Conducts meetings as chair.		4 Able to: .1 fulfill all requirements of company's manning policy, including grievance/disciplinary procedures; .2 manage the ship's crew in a professional and competent manner; .3 organise shipboard meetings; .4 implement operational plans, including their evaluation.

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PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
5 Custom House procedure	5 Knows: .1 procedure for entering and clearing ships; .2 role of ship's agents.		5.1 Correct procedure for Custom House entering and clearing is observed. 5.2 Deal with ship business between master and agent.
6 Full knowledge of the legalities of "seaworthiness"	6 Understands: .1 definition of the term "seaworthiness" and the term "sub-standard ship"; .2 implications of port State inspections and the responsibility of the master.		6 Deal with the implications of a port State inspection.
7 Safety of the ship and assistance to other vessels in distress	7 Knows the duties and obligations of the master in respect of: .1 the safety of the ship, crew and passengers; .2 assistance to vessels in distress; .3 stranding, collision, casualty, towage, salvage, Lloyds Standard Form of Salvage Agreement; understands the legal implications thereof.		7.1 That the safety of the ship, crew and passengers is at all times maintained. 7.2 Deal with the legal and practical implications relating to stranding, collision, casualty towage and salvage.
8 Law relating to navigation, marine casualties, marine enquiries, territorial waters	8.1 Knows: .1 the law relating to navigation including the prevention of collisions; .2 the requirements to report dangers to navigation; .3 the use of Maritime Safety information; .4 the requirements to report maritime casualties. 8.2 Understands these terms used in the Law of the Sea Convention: .1 territorial waters; .2 internal waters; .3 right of innocent passage; .4 international straits; .5 exclusive economic zones; .6 continental shelf; .7 high seas.		8 Deal with dangers to navigation, the legal requirements about a collision and maritime casualties.

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PERSONNEL MANAGEMENT AND SHIP BUSINESS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
9 Organisations connected with shipping	9 Detailed knowledge of: .1 Organisations concerned with shipping, including IMO and SAMSA .2 safety conventions, national legislation.		9.1 The role of various organisations concerned with safe shipping. 9.2 Maritime conventions and their implications on flag states. 9.3 The implications of maritime conventions on the ship.
10 Monitor and control compliance with legislation to ensure protection of the marine environment	10 Knowledge of: .1 the Master's duties and ship's liability regarding pollution at sea. .2 what records are to be maintained on board ship and the emergency action and response to an oil spill/pollution emergency.		10.1 No international spill or dumping at sea of oil, chemicals, sewage or waste materials occur. 10.2 That the crew are aware of their responsibilities regarding pollution prevention.
1 Vessel traffic services	11 Knowledge of vessel traffic services, mandatory and voluntary ship reporting systems. 12 Knowledge of clearing vessels inwards and outwards in foreign ports with emphasis on immigration, customs and health regulations.		11 Able to follow and report as per the procedure for a vessel traffic reporting service. 12 Able to deal with the correct procedures for arrival and departure from a foreign port.

Foreign ports (Note: This is only applicable to candidates for the Unlimited Waters Command Endorsement.)

Part 2AA: Draft Amendments to Code for South African Maritime Qualifications

METEOROLOGY (FISHING)			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCY	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
1 Shipboard meteorological instruments	<p>1.1 Understands the:</p> <ul style="list-style-type: none"> .1 basic principle of an aneroid barometer; .2 function of a hygrometer; .3 basic principles of wind sensors. <p>1.2 Able to:</p> <ul style="list-style-type: none"> .1 demonstrate ordinary readings of wind speed; .2 read the atmospheric pressure from an aneroid barometer; .3 read the temperature from a thermometer (wet and dry bulb). <p>2.1 Defines wind.</p> <p>2.2 Describes the:</p> <ul style="list-style-type: none"> .1 Beaufort scale of wind force; .2 method of estimating the strength of the wind from the appearance of the sea surface; .3 method of estimating the wind direction from the appearance of the sea surface, <p>and demonstrates an ability to use the Beaufort scale to estimate the strength of the wind and its direction from the appearance of the sea.</p> <p>2.3 Defines precipitation, rain, drizzle, hail, snow and sleet.</p> <p>2.4 Defines fog, mist and haze and states that visibility is reduced by the presence of particles in the atmosphere, near the earth's surface.</p> <p>2.5 Describes methods of estimating the visibility at sea by day and by night, and the difficulties involved.</p> <p>2.6 Names and describes the ten basic cloud types.</p> <p>2.7 Describes:</p> <ul style="list-style-type: none"> .1 the stages in the life cycle of a polar front 	<p>By oral examination, completion of approved education and training, 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; 3 approved simulator training, where appropriate; 4 approved laboratory equipment training. 	<p>1 Shipboard meteorological instruments are correctly used and read.</p>
2 Weather forecasting			<p>2.1 Current weather conditions are properly understood.</p> <p>2.2 The current and latest weather forecasts are obtained by the appropriate mean.</p>

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METEOROLOGY (FISHING)			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCY	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
	<p>depression in the southern hemisphere and the usual movement of the front; with the aid of a diagram, the weather experienced during the passage of a cold front in the southern hemisphere;</p> <p>2.8 Knowledge of:</p> <ol style="list-style-type: none"> .1 currents and seasonal weather patterns on the South African coast; .2 the formation and occurrence of abnormal waves on the eastern seaboard of South Africa; .3 the local winds and their causes. <p>2.9 Describes:</p> <ol style="list-style-type: none"> .1 the sources of weather information available to local shipping; .2 the appropriate local weather bulletins and their contents; .3 services provided for local storm warnings. 		
Weather forecasting and routing	<p>MODULE 2</p> <p>1 Knowledge of:</p> <ol style="list-style-type: none"> .1 services provided for shipping by meteorological offices including the types of services provided by facsimile machine; .2 appropriate weather bulletin and the contents of each of its sections; .3 services provided for storm warnings. <p>2 Lists the areas and seasons in which:</p> <ol style="list-style-type: none"> .1 strong winds at sea are experienced most often; .2 a high incidence of sea fog can be expected; <p>3 States:</p> <ol style="list-style-type: none"> .1 the typical weather signs of the approach of a tropical storm; 	<p>By oral examination, completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1 approved in-service experience; 2 approved training ship; 3 approved simulator training, where appropriate; 4 approved laboratory equipment training. 	<p>Show a practical ability to encode and decode weather information, interpret synoptic information and apply this to properly plan a sea passage.</p>

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METEOROLOGY (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCY	CRITERIA FOR EVALUATING COMPETENCE
	<p>.2 area and times where tropical storms frequently occur.</p> <p>4 Describes briefly:</p> <p>.1 the pattern of a tropical revolving storm;</p> <p>.2 the behaviour of tropical revolving storms in individual areas and individual pressure conditions;</p> <p>.3 the practical manoeuvring rules for avoiding the centre of a tropical revolving storm;</p> <p>.4 the aid of a figure the most probable track of a tropical storm in various ocean areas.</p> <p>5 States the regulations given in SOLAS regarding reporting a tropical revolving storm.</p> <p>6 Explains the:</p> <p>.1 importance of an early warning of a tropical storm;</p> <p>.2 actions to be taken to avoid the storm centre and its vicinity.</p> <p>7 Lists the information that should be included in a report of a tropical storm.</p> <p>8 Able to:</p> <p>.1 identify:</p> <p>.1.1 a cold front, a warm front and an occlusion on a synoptic chart;</p> <p>.1.2 the air masses on a weather chart;</p> <p>.1.3 areas of maximum waves.</p> <p>2 read the codes on a synoptic chart;</p> <p>3 estimate:</p> <p>.3.1 the probable track directions of the various air masses;</p> <p>.3.2 wind directions from the isobars on the weather chart.</p> <p>.3.3 of expected area or precipitation or fog.</p> <p>.3.4 or expected area of icing;</p>		

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METEOROLOGY (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCY	CRITERIA FOR EVALUATING COMPETENCE
	.4 calculate the wind force from the isobars on the weather chart; .5 demonstrate an analysis of a synoptic chart as a whole; .6 forecast area weather from a synoptic chart as a whole; .7 interpret a prognostic chart of area weather.		

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SHIP MANOEUVRING AND HANDLING (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Manoeuvre the ship	<p>Knowledge of:</p> <ol style="list-style-type: none"> 1 the effects of a single and twin propeller(s) on the turning circle of a ship; 2 the effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances; 3 the effects of wind and current on ship handling; 4 manoeuvres and procedures for the rescue of persons in distress and man overboard; 5 squat, shall-water, interaction between ships, canal effect and similar effects; 6 proper procedures for anchoring and mooring; and 7 basic manoeuvres and duties during berthing and unberthing and the use of the various mooring ropes when alongside. 8 manoeuvring during fishing operations with special regard to factors that could adversely affect the vessel's safety during such operations; 9 towing and being towed; 10 berthing, unberthing, anchoring and manoeuvring alongside other vessels at sea. 	<p>Oral examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1 approved in-service experience; 2 approved training ship experience; 3 approved simulator training, where appropriate 4 approved training on a manned ship model where appropriate. 	<ol style="list-style-type: none"> 1 Safe operating limits of ship propulsion, steering and power systems are not exceeded in normal manoeuvres. 2 Adjustments made to the ship's course and speed maintain safety of navigation.
MODULE 2			
Manoeuvre and handle a ship in all conditions	<p>Manoeuvring and handling a ship in all conditions, including:</p> <ol style="list-style-type: none"> 1 manoeuvres when approaching pilot stations and embarking or disembarking pilots, with due regard to weather, tide, headreach and stopping distances; 	<p>As for module 1.</p>	<ol style="list-style-type: none"> 1 All decisions concerning berthing and anchoring are based on a proper assessment of the ship's manoeuvring and engine characteristics and the forces to be expected while berthed alongside or lying at anchor. 2 While under way, a first

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SHIP MANOEUVRING AND HANDLING (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>2 handling ship in rivers, estuaries and restricted waters, having regard to the effect of current, wind and restricted water on helm response;</p> <p>3 interaction between passing ships and between own ship and nearby banks (canal effect);</p> <p>4 berthing and unberthing under various conditions of wind, tide and current with and without tugs;</p> <p>5 ship and tug interaction;</p> <p>6 use of propulsion and manoeuvring systems; choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used;</p> <p>8 dragging anchor; clearing fouled anchors;</p> <p>9 dry-docking, both with and without damage;</p> <p>10 management and handling of ships in heavy weather, including assisting a ship or aircraft in distress; towing operations; means of keeping an unmanageable ship out of trough of the sea, lessening drift and use of oil;</p> <p>11 precautions in manoeuvring to launch rescue boats or survival craft in bad weather;</p> <p>12 methods of taking on board survivors from rescue boats and survival craft;</p> <p>13 ability to determine the manoeuvring and propulsion characteristics of common types of ships with special reference to stopping distances and turning circles at various draughts and speeds;</p> <p>14 importance of navigating at reduced speed to avoid damage caused by own ship's bow wave and stern wave;</p> <p>15 use of, and manoeuvring in and near, traffic separation schemes and in vessel traffic service</p>		<p>possible effects of shallow and restricted waters, ice, banks, tidal conditions, passing ships and own ship's bow and stern wave so that the ship can be safely manoeuvred under various conditions of loading and weather.</p>

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SHIP MANOEUVRING AND HANDLING (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	(VTS) areas: 16 transferring fish at sea to factory ships and other vessels; 17 refuelling at sea.		

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FISHING SAFETY			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
1 Prepare ship and equipment for the fishing operations	<p>1.1 Knows the accepted practice for repairing, replacing, maintaining and positioning of the relevant fishing gear.</p> <p>1.2 Can recognise irregularities, damage or defects as appropriate to the relevant fishing gear.</p> <p>1.3 Knows how to report clearly and in good time, to his/her supervisor, any irregularities, damage or defects.</p>	<p>A Oral examination and assessment of evidence obtained from theoretical instruction.</p> <p>B Oral examination and assessment of evidence obtained from practical experience gained through on board training.</p>	<p>1 All relevant fishing gear is properly maintained, repaired, replaced and positioned as required for safe operation.</p> <p>2 Reports timeously any defects, damage or irregularities to supervisor.</p> <p>3 Instructions from supervisor are carried out.</p> <p>4 Protective/safety gear is correctly worn during fishing operations.</p>
2 The process of handling fishing gear	<p>2.1 Be aware of safety rules applicable especially with regard to dangers caused by vessel's motion, slippery surfaces, fire prevention and fire hazards, and personal protection equipment.</p> <p>2.2 Understand the instructions given by his/her supervisor regarding the operation and be familiar with common terms used in the fishing industry.</p> <p>2.3 Knows that irregularities are likely to occur and understands the action to take to protect life and property.</p>		
3 Stowing of the general safety	<p>3.1 Understands the importance of the current safety rules.</p> <p>3.2 Understands the importance of his/her supervisor's instructions.</p> <p>3.3 Knows that proper catch stowage and fishing gear is important for vessel/crew safety.</p> <p>3.4 Understands the operation of ship's valves and offal chutes and can seal spaces from water ingress.</p> <p>3.5 Understands the operation of dill/bulge/factory decks pumps for removal of water from areas.</p> <p>3.6 Knows that loading/discharging operations can affect the stability of the vessel especially with regard to heeling moments from gear and catch.</p>		

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FISHING SAFETY			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 2			
<p>The process of handling fishing gear/catch stowage</p>	<p>1 Understands the importance that sufficient and fit personnel are available to ensure safe and efficient fishing operations. 2 Knows that equipment checks must be made prior to the beginning of fishing operations and to ensure that operations are carried out in accordance with safety rules. 3 Understands that reports of any irregularities, damage or defects are evaluated and rectified. 4 Knows that instructions are to be given to ratings involved in stowing of catch (when appropriate) to ensure that the operation is carried on in time and according to safety rules. 5 Familiar with construction, application and purpose of deck equipment that includes, but is not limited to, trawl galleys, gantries, power blocks, pursuing blocks, winches and booms, derricks, net drums and side rollers and line and trap haulers. 6 Be familiar with the dangers associated with fishing operations such as shooting all types of fishing gear into the water, hauling fishing gear and landing the catch on board.</p>	<p>As for module 1.</p>	<p>Plans and implements the process of gear handling in accordance with the relevant safety rules.</p>

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EMERGENCY PROCEDURES (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Respond to emergencies and distress signals at sea, and emergencies in port	<p>1 Able to take measures in emergencies for the protection and safety of ship, passengers and crew in that the candidate must be able to:-</p> <ol style="list-style-type: none"> .1 muster persons and launch life saving appliances; .2 execute a man overboard drill; .3 organize an emergency party; .4 react properly to a distress signal; and .5 take charge of life-saving appliances. <p>2 Able to take initial action following a collision or grounding; initial damage assessment and control in that the candidate must be able to identify the actions:</p> <ol style="list-style-type: none"> .1 to be taken following a collision; .2 to be taken following a grounding; .3 the precautions for the protection of and safety of crew passengers in emergency situations; .4 the means of limiting damage and salvaging the ship following a fire or explosion; .5 the procedure for abandoning ship; .6 the precautions for ensuring the security of the ship whilst in port; .7 the actions to be taken when emergencies arise in port; .8 the procedure to bring a ship up short or turn it short round using an anchor on a short scope of chain. <p>3 Able to use the auxiliary steering and know the rigging and use of jury steering arrangements.</p> <p>4 Know the area of operation and procedures of the SASAR organization.</p>	<p>Oral examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1 approved in-service experience; 2 approved training ship experience; 3 approved simulator training where appropriate; 4 practical training. 	<ol style="list-style-type: none"> 1 The type and scale of the emergency is promptly identified. 2 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.

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EMERGENCY PROCEDURES (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 2			
Respond to emergencies and distress signals at sea, and emergencies in port	<p>1 Thorough knowledge of the actions required to execute the correct response to those emergencies and actions listed in module 1.</p> <p>2 Knowledge of:</p> <ul style="list-style-type: none"> .1 precautions when beaching a ship; .2 action to be taken if grounding imminent, or after grounding; .3 refloating a grounded ship with and without assistance; and .4 action to be taken if collision is imminent and following a collision or impairment of the watertight integrity of the hull by any cause. <p>3 Thorough knowledge of:</p> <ul style="list-style-type: none"> .1 emergency steering; .2 emergency towing arrangements and towing procedures; and .3 the assessment of damage control. <p>4 Thorough knowledge of the IMO world SAR plan and the SASAR manual.</p>	<p>Oral examination and assessment of evidence obtained from practical instruction, in-service experience and practical drills in emergency procedures.</p>	<p>1 The type and scale of any problem is promptly identified and decisions and actions minimize the effects of any malfunction of the ship's systems.</p> <p>2 Communications are effective and comply with established procedures.</p> <p>3 Decisions and actions maximize safety of persons on board.</p>

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COMMUNICATIONS (FISHING)			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Use MSI information	<ol style="list-style-type: none"> 1 Able to use the International Code of Signals. 2 Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, concerning ship's safety and operation, to communicate with other ships and coast stations. 3 Knowledge of the different types of MSI signals, their means of transmission, Navareas, Metareas, and the responsibility to generate navigational warnings. Make use of the South African list of radio signals in the ability to receive such signals. <p><i>Note:</i> Candidates in the examinations for skipper and deck officer certificates will only be required to have a local knowledge regarding the use, receipt and transmission of MSI.</p>	<p>Assessment of evidence obtained from written, practical and oral examination.</p> <ol style="list-style-type: none"> 1 2 3 	<p>English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted. Communications are clear and understood. Receive a navigational warning, meteorological forecast, SAR message and make the correct decisions regarding the contents of such a message. Generate a navigational warning in accordance with the requirements of the SOLAS Convention.</p>
MODULE 2			
<ol style="list-style-type: none"> 1 Transmit and receive information by visual signalling 2 Use the Standard Marine Navigational Vocabulary as replaced by the IMO Phrases and use English in written and oral form 	<ol style="list-style-type: none"> 1.1 Able to transmit and receive signals by morse light. 1.2 Able to use the International Code of Signals. 2 Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, concerning meteorological information and messages with other ships and coast stations and to perform the officer's duties also with multilingual crew, including the ability to use and understand the Standard Marine 	<p>As for module 1.</p> <ol style="list-style-type: none"> 1 2.1 2.2 	<p>Read a flashing morse white light at a rate of three words per minute and that the communications, within the operator's area of responsibility are consistently successful. English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted. Communications are clear and understood.</p>

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COMMUNICATIONS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
3 Use MSI information	<p>3 Knowledge of the different types of MSI signals, their means of transmission, Navarea, Metarets, and the responsibility to generate navigational warnings. Make use of the Admiralty list of radio signals in the ability to receive such signals.</p> <p>3 Knowledge of the different types of MSI signals, their means of transmission, Navarea, Metarets, and the responsibility to generate navigational warnings. Make use of the Admiralty list of radio signals in the ability to receive such signals.</p>		<p>3 Receive a navigational warning, meteorological forecast, SAR message and make the correct decisions regarding the contents of such a message. Generate a navigational warning in accordance with the requirements of the GAT A.C.C.</p>

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ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
1	Understand the theoretical principles of marine engineering knowledge	A	Demonstrates a clear understanding of marine engineering knowledge.
2	Understand the working and operation of onboard auxiliary machinery and ship propulsion system	B	
1	Understand terms used in machinery spaces and names of machinery equipment and an elementary knowledge of the main parts of the propelling machinery. Understand engine room watchkeeping procedures: .1 know how to and why read and record temperatures, pressures and fluid levels. Understand how to take over and hand over a watch; .2 know how to deal with minor defects in the propelling and auxiliary machinery; .3 maintain batteries in proper working order; .4 keep bilges empty and clean, is familiar with bilge pumping systems; .5 know how to take out of service and clean and put on line duplex filters; .6 know how to assist in manual operation of automated machinery; .7 know how a diesel engine is prepared for standby and starting. 3 Understand the basic construction and operation of the following: .1 diesel engines: .1.1 the 4-stroke diesel engine; .1.2 the 2-stroke diesel engine; .1.3 the main engine cooling water system, lubrication oil system, fuel system, scavenge air system and starting systems; .1.4 mechanism of starting and reversing arrangements; .2 auxiliary machinery and systems;	A Written examination and assessment of evidence obtained from theoretical instruction, display diagrams and associated practical knowledge B Oral examination and assessment of evidence obtained from practical experience gained through sea going service.	

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ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>2.1 know and understand names and functions of the main parts of refrigeration machinery and has a working knowledge of a basic refrigeration systems;</p> <p>2.2 classify pumps as reciprocating pumps, centrifugal pumps and mono pumps;</p> <p>2.3 describe the type of valves used onboard and their function;</p> <p>2.4 be able to illustrate by means of sketches typical pumping arrangements such as bilge, fire main, and deck wash and fuel oil bunkering systems. Understand the necessity to keep bilges empty;</p> <p>3 steering gear arrangement:</p> <p>3.1 describe basic principles of the steering system;</p> <p>3.2 explain how to steer from the emergency position;</p> <p>4 generators, alternators and electrical distribution:</p> <p>4.1 require basic knowledge of electricity and distribution systems, including protection devices on board ship;</p> <p>4.2 describe precautions to take when working on or near electrical systems;</p> <p>4.3 describe the safety precautions to be observed for battery compartments.</p> <p>5 Safe working practise as related to engine room operations:</p> <p>.1 precautions to take when working in enclosed spaces;</p> <p>.2 precautions to take when working on high pressure or high temperature piping systems.</p> <p>6 Fuel oil bunkering:</p> <p>.1 know how to prepare for taking bunkers and carry</p>		

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ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	out safe bunkering procedures.		
MODULE 2			
1 Understand the theoretical principles of marine engineering knowledge	1 Prepare main and auxiliary machinery for sea and testing of steering gear.	As for module 1.	As for module 1.
2 Understand the working and operation of onboard auxiliary machinery and ship propulsion system.	2 Understand record of engine room logbook and significance of readings taken. 3 Understand routine pumping operations of fuel oil, fresh and salt water and bilge system and location of common faults. 4 Understand starting, coupling and changing over alternators and/or generators. 5 Know safety precautions to be observed during a watch and the immediate action to be taken in the event of a fire or accident, including electric shock. 6 Know precautions to be observed to prevent environmental pollution, operation and maintenance of emergency equipment. 7 Know the use and constructional details of measuring instruments for temperatures and pressure and the operating principles of the ammeter and voltmeter. 8 Know how various machinery components are manufactured and the effects of various treatments on the physical properties of the materials commonly used. 9 Understand and know the construction, arrangements and operation of steering systems, constructional details and maintenance of pressure vessels, constructional details and principles of action of pumps and general requirements for pumping systems. 10 Understand the safe and efficient operation and maintenance of electrical equipment. 11 Understand the efficient operation and maintenance of auxiliary boilers.		

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ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	12 Understand the working principles and constructional details of marine diesel engines together with their ancillary equipment such as gearboxes, clutches, thrust bearings and transmission systems. 13 Understand the operation and maintenance of diesel engines, determination of engine power, starting and reversing systems. 14 Know the properties of fuel and lubricating oils used in diesel engines. 15 Understand fuel systems and lubricating oil systems. 16 Know the constructional details and working principle of air compressors. 17 Understand basic electrical circuits including alternating current and direct current systems. 18 Understand basic hydraulic and pneumatic circuits and their maintenance. 19 Understand the safe operation and maintenance of deck machinery. 20 Know precautions against factory deck flooding.		
MODULE 3			
1 Understand the theoretical principles of marine engineering knowledge 2 Understand the working and operation of onboard auxiliary machinery and ship propulsion system	Watchkeeping practice: 1 Routine associated with taking over and accepting a watch—understand and know: .1 responsibility of the watchkeeper; .2 procedure for taking over a watch; .3 precise nature of the logbook check; .4 routine of handing over a watch; .5 advice of changes during watch or abnormalities; .6 compilation of machinery space logbook; .7 Understanding of essential operating parameters, the upper and lower bounds; .8 recording of incidents during the watch;	As for module 1.	As for module 1.

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ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>2</p> <p>.9 changes in recording during stand-by periods; .10 The legal implications of the log book. Duties undertaken during a watch—understand and know:</p> <p>.1 routine inspections of all machinery spaces; .2 use of all senses during rounds; .3 specific watch responsibilities; .4 unusual conditions in machinery spaces; .5 action in case of auxiliary machinery failure or black-out; .6 action in case of fire; .7 observation of leaks, pipe bursts, oil spills etc; .8 sudden main engine failure.</p> <p>3</p> <p>Preparing to proceed to sea—understand and be able to: .1 start air, fuel, lubricating oil and circulating water systems; .2 warm through; .3 turn over main and auxiliary engines; .4 test alarms, telegraph and steering gear; .5 prepare main engine, prime, turning gear out, etc</p> <p>4</p> <p>Preparing for arrival in port—understand and be able to: .1 test telegraph; .2 start stand-by auxiliaries.</p> <p>Materials:</p> <p>1</p> <p>Production of iron and steel—understand: .1 properties of iron and steel; .2 strength, ductility and elasticity; tensile test, malleability, compression test, toughness, brittleness.2 Manufacturing processes and treatments—have knowledge of: .1 casting, forging, rolling, spinning, drawing, extrusion; .2 machining and welding;</p>		

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ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>3 heat treatment;</p> <p>4 hardening, tempering, toughening, annealing, normalising, stress relieving;</p> <p>5 surface hardening.</p> <p>4 Alloying and effect on properties—have knowledge of:</p> <p>1 alloying elements;</p> <p>2 nickel, chromium, tungsten, molybdenum, vanadium, silicon, copper, lead, cobalt, boron, titanium;</p> <p>3 effect of these elements on the properties of the metal.</p> <p>5 Non-ferrous metals—have knowledge of:</p> <p>1 aluminium, copper, lead, platinum, tin, zinc;</p> <p>2 common brasses and bronzes;</p> <p>3 cupro-nickel and aluminium-nickel bronzes;</p> <p>4 white metal and other bearing metals;</p> <p>5 suitability of above metals to withstand corrosion, fatigue, heat, erosion, creep and cavitation;</p> <p>6 castability and reparability of these metals.</p> <p>Instrumentation and control: Understand basic operating principles and constructional details:</p> <p>1 pressure measurement;</p> <p>2 barometers;</p> <p>3 manometers: U-tube;</p> <p>4 Bourdon tubes: C, spiral and helical tubes;</p> <p>5 temperature measurement;</p> <p>6 liquid-in-glass, liquid-in-steel, vapour and gas filled systems;</p> <p>7 bimetal thermometers;</p> <p>8 flow measurement;</p> <p>9 level measurement;</p> <p>10 direct reading methods: sight glass, floats;</p>		