

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

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>11 viscosity measurement; 12 electrical: tachometer; 13 liquid density: hydrometers.</p> <p>Internal combustion engines:</p> <p>1 Understand and know principles of operation: .1 two stroke, four stroke; .2 lubrication, cooling, fuel, scavenge and air starting systems; .3 automatic control for above systems.</p> <p>2 Construction—understand and have knowledge of: .1 engine framework; .2 bedplates, A-frames, cylinder blocks and tie bolts; .3 holding down bolts; .4 collision chocks; .5 crankshafts, connecting rods, crossheads; .6 cylinder liners, pistons, piston rings; .7 wear and lubrication; .8 cylinder covers, exhaust valves, cams and rocker arms; .9 fuel injectors and pumps; .10 starting and reversing arrangements.</p> <p>3 Engine-room operations—be able to: .1 prepare engine for departure to sea; .2 prepare for arrival at next port; .3 take action in abnormal conditions such as failure in lube oil, fuel and cooling water systems; failure of engine component; scavenge fire; crankcase or air start system explosion.</p> <p>Fuel oil and lubricants:</p> <p>1 Have an understanding and knowledge of: .1 properties of fuel oil: density, viscosity, flash point, etc;</p>		

Part 2AA: Draft Aime me Code for South African Maritime Qualificatio

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 methods of storing; 3 tank fittings; 4 wire gauze; 5 danger of oil spilling, leakage and contamination; 6 precautions to be taken during routine pumping operations; 7 precautions when working in oil tanks; 8 purification, clarification, filters. Have an understanding and knowledge of:</p> <p>1 animal, vegetable, mineral and compound oils; 2 methods of storing; 3 filters and strainers; 4 lubrication fundamentals; 5 boundary and hydrodynamic lubrication; 6 lubricating oil additives; 7 lubricating oil tests; 8 grease.</p> <p>Steam plant and auxiliary systems:</p> <p>1 Understand the construction and operation of: .1 auxiliary boilers, steam-steam generators and exhaust gas economisers; 2 soot blowers and soot collectors; 3 boiler mountings; 4 setting safety valves and water gauges; 5 combustion equipment; 6 boxing up, filling a boiler and raising steam; 7 precautions when opening steam valves; 8 cause and danger of water hammer; 9 correct method of blowing gauge glasses; 10 routine operating observations and log; 11 shutting down a boiler for a short period; 12 repairs;</p>		

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

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING & PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
	<p>.13 inspection of water and gas sides for defects; .14 action to be taken in abnormal conditions, high or low water level, leaking tubes or shell, soot fires in uptakes, oil leakage and furnace front fire.</p> <p>2 Understand and be able to describe:</p> <p>.1 a closed feed system, condenser, a hot well and feed pump; .2 producing distilled water, evaporators, corrosion and scale formation; .3 boiler water treatment and routine tests; .4 caustic embrittlement; .5 sources of contamination, precautions and action.</p> <p>Power transmission systems: Understand the construction and operation of:</p> <p>1 a thrust bearing; 2 shaft bearings; 3 stern tube; 4 water and oil lubricated types; 5 stern tube seals; 6 propellers, fixed blade, built up and controllable pitch; 7 steering gear, types of steering gear, pre-sea checks, routine checks and emergency operation of steering gears.</p> <p>Pumps and pumping systems: 1 Understand the construction and operation of: .1 reciprocating, single and double acting pumps; .2 gear, screw, vane, lobe pumps; .3 discharge pressure control; .4 centrifugal pumps and air pumps for suction; .5 types of valves and ship-side fittings. 2 Be able to describe by means of sketches:</p>		

Part 244 - Draft Amendments to Code for South African Maritime Qualifications

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	<p>.1 bilge pumping systems, oily water separators; .2 emergency bilge pumping arrangements; .3 precautions against flooding; .4 domestic cold water system; .5 fresh water generators; .6 domestic hot water system.</p> <p>Refrigeration systems: 1 Constructional arrangement, details and working of refrigerating machinery and auxiliary machinery on board fishing vessels: compressors, condensers, evaporators, expansion valves, liquid receivers, liquid stop valves, refrigerants, danger of refrigerants, lubricants, oil separators, danger of entering cool spaces, CO₂ gas.</p> <p>2 Describe refrigeration cycle by means of sketch.</p> <p>Fire and safety: 1 Safety measures and precautions: .1 methods of extinguishing, fire detection methods, patrols, alarm circuits, fixed installation systems; .2 dangers of leakage from oil tanks, pipes, gas products and vaporizers, particularly in bilges and other unventilated spaces; .3 precautions against fire or explosions due to oil or gas; .4 flash point; .5 explosive properties of gas or vapour given off by fuel or lubricating oils when mixed with air; .6 action of wire gauze diaphragms and the places in which such devices should be fitted.</p> <p>2 Operation of fire-fighting equipment: .1 CO₂ gas flooding systems, and fixed fire smothering installations;</p>		

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

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 Fire detection methods, patrols, alarm circuits.</p> <p>Marine electrical equipment and systems:</p> <ol style="list-style-type: none"> 1 Preparing, starting and running of diesel and steam turbines. 2 Sequences of paralleling alternators and generators. 3 Operation of shaft generators. <p>Ship maintenance & management:</p> <ol style="list-style-type: none"> 1 Machinery and hull surveys: <ol style="list-style-type: none"> .1 reasons for survey, compare statutory and Class surveys, preparing for surveys; .2 inspection techniques: inspection before dismantling, recording relevant facts, usual measurement; .3 condition and performance monitoring: interpreting changes in instrument readings on machines, vibration monitoring techniques. 2 Statutory responsibility of the chief engineer, second engineer and engineer officer: <ol style="list-style-type: none"> .1 temporary or permanent repairs in the event of breakdown; .2 methods of dealing with wear and tear of machinery and boilers. 		

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

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Understand and apply the principles of electricity			
1 Electron Theory	<p>1.1 Understands and describes the following: atoms, molecules, ions, a compound, an element ionization.</p> <p>1.2 Describes:</p> <ol style="list-style-type: none"> .1 current flow in a conductor and circuit; .2 potential difference; .3 conductors and insulators with examples. <p>1.3 Explains the following electrical terms with relevant symbols: current, volt, direct and alternating current, static electricity, resistance, volt drop.</p>	Examination and assessment of evident obtained from theoretical instruction as associated laboratory or workshop practical training.	
2 Diagrams and symbols	<p>2.1 Draws simple circuit diagrams using the correct symbols for electrical components.</p> <p>2.2 Describes parallel and series circuits.</p>		
3 Electrical theory	<p>3.1 Defines the following: Ohm's Law; Kirchoff's Law.</p> <p>3.2 Describes the uses of the Wheatstone Bridge.</p> <p>3.3 Calculates the voltage, current or resistance in parallel or series circuits.</p>		
4 Electrical instruments and test applications	<p>4.1 Sketches and describes the units and their application: Voltmeter and an ammeter.</p> <p>4.2 Describes:</p> <ol style="list-style-type: none"> .1 the use of shunts and series resistors; .2 the following testing equipment: insulation tester and continuity tester, multi tester. 		
5 Work, energy and power	<p>5.1 Explains, with the relevant symbols, the difference between work, energy and power.</p>		Demonstrate a clear theoretical and practical application of electricity.

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

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
11 Electromagnetic induction	<p>length of conductor.</p> <p>11.1 Describes electromagnetic induction and its application.</p> <p>11.2 Explains:</p> <ul style="list-style-type: none"> .1 the affect on induced voltage from flux density, number of turns in the coil and conductor/flux cutting rate; .2 flux linkages, Faraday's and Lenz's Laws, static, mutual and self induction, dynamic induction. <p>12.1 Knows and uses Fleming's hand Rules.</p> <p>12.2 Explains, with sketches the functions of: the armature, the commutator, sliprings, brush mechanism, field coils and poles, inter-poles.</p> <p>12.3 Describes:</p> <ul style="list-style-type: none"> .1 variation in a simple loop generator; .2 the circuits of Shunt, and applications series and compound AC Motors; .3 the purposes of a DC motor starter; .4 the DC generator circuits for excitation and draws load characteristics; .5 two types of windings for DC generators. <p>13.1 Describes:</p> <ul style="list-style-type: none"> .1 AC voltage with respect to root means square, peak values; .2 3 phase generations and the 3 phase star connected alternator; .3 the salient pole generator; .4 excitation, automatic voltage regulation, synchronizing sequence, parallel running, cooling; .5 the emergency power generation system; .6 single and 3 phase induction motor components and basic operation; 		
12 Generators and motors			
13 AC alternators and motors			

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

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>14 Alternating current</p> <p>15 Transformers</p> <p>16 Distribution</p>	<p>.7 the graphs of the relationships: speed and load and current and load;</p> <p>.8 direct-on-line starter, star-delta starter, star connected running and auto-transformer starter;</p> <p>.9 protection and the reasons for it; for fuses, over current relays, over current trip, thermal relay, thermostat, phase open circuit, under voltage trip, the term single phasing;</p> <p>.11 ways of varying speeds;</p> <p>.12 Ward-Leonard drive and variable-frequency motor principles.</p> <p>13.2 Explains that frequency is proportional to rotation speed.</p> <p>14.1 Describes AC generation in a simple loop rotating in a magnetic flux and relates the loop position to voltage wave form.</p> <p>14.2 Explains:</p> <p>.1 the relationship between instantaneous voltage, conductor velocity and the sine of the displayed angle</p> <p>es;</p> <p>2 root mean square (rms) values</p> <p>14.3 Defines frequency and appropriate units and symbols.</p> <p>14.4 Describes:</p> <p>.1 a 3 phase supply circuit;</p> <p>2 phase difference between voltage and current.</p> <p>15 Describes:</p> <p>.1 the construction principles and operation of transformers;</p> <p>.2 the transformer connections; Star-Star, Delta-Delta, Star-Delta or Delta-Star;</p> <p>.3 transformer checks and maintenance requirements</p> <p>16.1 Describes:</p>		

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

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING & PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
17 Protection	<p>.1 the purpose of switches, circuit breakers and fuses; .2 the sources of emergency electrical power supply and systems supplied; .3 insulated systems and earthed-neutral systems.</p> <p>16.2 Explains: .1 an open circuit, earth and short circuit; .2 how earth faults occur and are detected.</p> <p>17.1 Describes: .1 protection and the reasons for its installation; .2 3 types of overcurrent protection relay.</p> <p>17.2 Explains: .1 the high rupturing-capacity fuses; .2 preferential tripping, undervoltage and reverse power protection; .3 the dangers for replacing a blown fuse, entering spaces near busbars and opening switchboard cubicles; .4 switchboard instruments transformers and any potential dangers.</p>		
18 Cables	<p>18 Describes: .1 materials and the reasons for the following in cables: conductors, insulation and sheathing; .2 resistance and why terminals are to be secured and locked.</p>		
19 Maintenance	<p>19 Describes: .1 system isolation, carbon brush replacement and insulation resistance; .2 circuit breaker maintenance noting handling, tripping and interlocks.</p>		

Part 2AA: Draft dm So Ma Qu

APPLIED MARINE SCIENCE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Obtain the mathematical skills required for an understanding of the theoretical knowledge in the certificate courses 1 Algebra	1.1 Knows: .1 the standard algebraic manipulations leading to the transportation of equations and their solution. .2 how to produce a graph of given or observed data and extract information from the graph. .3 how to convert between polar and rectangular co-ordinates. .4 how to interpolate quickly and accurately. .5 the properties of the ellipse. 1.2 Defines: "error" as the observed or calculated value minus the true value. 1.3 Explains the meaning of "absolute error" and "relative error"	Written examination and assessment of evidence obtained from theoretical instruction.	1.1 Transposes equations to isolate a given variable. 1.2 Solves: .1 equations, giving answers rounded to a specified number of decimal places or significant figures. .2 problems leading to linear equations. .3 problems leading to simulations linear equations in two unknowns. 1.3 Plot points, given their Cartesian co-ordinates. 1.4 Draws: .1 a smooth graph through plotted points. .2 a graph of given functions. 1.5 Given the abscissa, reads the value of the ordinate and vice versa. 1.6 Extracts values from graphs on ship's data 1.7 Uses: .1 linear interpolation to find intermediate values in table such as ullage tables, deadweight scales, deviation table. .2 a calculator to convert between polar and rectangular co-ordinates. 1.8 Interpolates in tables with two arguments. 1.9 Performs linear extrapolation. 1.10 Constructs by plotting an ellipse. 2.1 Solves: .1 problems reducible to right-angle triangles of trigonometrical functions.
	2 Trigonometry 2.1 Proficient in the use of trigonometrical function of angles. 2.2 Knows:		

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

APPLIED MARINE SCIENCE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
3 Mensuration and geometry	<p>.1 the range of values of trigonometrical functions.</p> <p>.2 the range of values of the inverse functions.</p> <p>.3 the value of radian.</p> <p>3 Knows:</p> <p>.1 perimeters and areas.</p> <p>.2 the areas of sectors and segments of a circle.</p> <p>.3 surface areas and volumes.</p> <p>.4 Simpson's 1st, 2nd and 3rd Rule.</p> <p>.5 the construction of a circle through two known points when angle between two points is known (Snellius Problem).</p> <p>.6 the properties of figures, parallel lines and constructions.</p>		<p>.2 problems on oblique plane triangles using the cosine and sine formulae.</p> <p>2.2 Converts:</p> <p>.1 polar co-ordinates to Cartesian and vice versa.</p> <p>.2 angles into radians and vice versa.</p> <p>3.1 Calculates:</p> <p>.1 the perimeters and areas of:</p> <p>.1.1 a square</p> <p>.1.2 a rectangle</p> <p>.1.3 a parallelogram</p> <p>.1.4 a trapezium</p> <p>.1.5 a triangle</p> <p>.1.6 a circle</p> <p>.2 the areas of sectors and segment of a circle.</p> <p>.3 the surface areas and volume of:</p> <p>.3.1 a cube</p> <p>.3.2 a rectangular and</p> <p>.3.3 a triangle prism</p> <p>.3.4 a cylinder</p> <p>.3.5 a sphere</p> <p>.4 areas and centroids of irregular figures.</p> <p>.5 volumes and centre of gravity of volumes of irregular figures.</p> <p>.6 the distance from an object when the height and subtended vertical angle is known.</p> <p>3.2 Constructs:</p> <p>.1 a circle through two known points when angle subtended between the two points is known.</p> <p>.2 a triangle from given data.</p>

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

APPLIED MARINE SCIENCE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
4 Vectors	<p>4 Knows:</p> <ul style="list-style-type: none"> .1 that vector quantities have direction as well as magnitude. .2 the graphical solution of sums and differences of vector quantities 		<p>3.3 Determines</p> <ul style="list-style-type: none"> .1 by plotting three given points and the angles subtended by pairs of those points at a position. .2 are length given radius and angle of sector. <p>3.4 Uses Pythagoras' theorem to calculate one side of a right-angled triangle, given the other two.</p> <p>4.1 Calculates:</p> <ul style="list-style-type: none"> .1 the vector sum of two or more vectors by graphical methods. .2 the difference between two vectors by graphical methods. .3 sums an difference of vectors by resolution into perpendicular directions. <p>4.2 Resolves:</p> <ul style="list-style-type: none"> .1 a given vector into components in two specific directions by drawing. .2 a given vector into components in two specific perpendicular directions by calculation. <p>5.1 Draws bar and pie charts, histograms and frequency polygons from given data.</p> <p>5.2 Calculates:</p> <ul style="list-style-type: none"> .1 mode, meridian and mean. .2 standard deviation. <p>6 Constructs:</p> <ul style="list-style-type: none"> .1 an ellipse by plotting. .2 a family of hyperbola.
5 Statistics	<p>5 Knows:</p> <ul style="list-style-type: none"> .1 graphical representation of data. .2 measures of central tendency. .3 standard deviation. <p>6 Knows the properties of the ellipse and hyperbola.</p>		
6 Ellipse and hyperbola			

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

DRAWINGS (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 and apply the principles of mechanical drawing</p> <p>1 Types of drawings</p> <p>2 Linework</p> <p>3 Pictorial projections</p> <p>4 Development</p> <p>5 Screw threads and fasteners</p> <p>6 Locking and retaining devices</p>	<p>1.1 Explains the following: general arrangement assembly, component, pictorial drawings.</p> <p>1.2 Storage of drawings: cabinet, computer and microfilm.</p> <p>2.1 Draws examples of lines, tangents.</p> <p>2.2 Demonstrates first angle and third angle projections including hidden detail.</p> <p>2.3 Completes orthographic projections with sectional views.</p> <p>3 Draws isometric and oblique projections.</p> <p>4 Draws developments of circular tranking intersections, cone, square pyramid, square-to-round transition pad.</p> <p>5.1 Identifies and describes left- and right-hand threads, thread terminology, thread types, multiple threads, hexagonal nut.</p> <p>5.2 Draws threads, nut, studs, bolt, washer assemblies.</p> <p>5.3 Identifies and describes the socket-head screw and machine screw ranges</p> <p>6 Describes:</p> <ol style="list-style-type: none"> .1 locking plate; Simmonds lock-nut; lock, spring and tab washer and peering and wire locking; .2 taper pins; bifurcated taper pins; parallel and split pins; wire rings and air clips. 	<p>Examination and assessment of evident obtained from completing mechanical drawings.</p>	<p>Demonstrate by completing and extracting information from mechanical drawings.</p>

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

DRAWINGS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
7 Riveted-type fastenings	7 Describes: .1 the different rivet heads, blind rivet nuts and blind screw anchors; .2 the 4 riveted types of joints; .3 the "hubbolt" fastener.		
8 Welded connections	8 Describes various welded connections and the symbols.		
9 Dimensioning	9 Describes datum dimensioning and dimensions a simple component with the correct standards.		
10 Limits and fits	10 Describes limit and fit; tolerance, basic, actual nominal size; fits and selective assembly.		
11 Geometrical tolerancing	11 Describes geometrical tolerancing giving the symbols.		
12 Cams	12 Constructs cam profiles to give uniform velocities and dwell period to the follower		
3 Bearings, seals and lubrication	13 Describes: .1 direct lined bearings; solid or lined inserts and the walled type bearings; .2 lubrication properties and the different types of bearing metals; .3 Ball and roller bearings; the radial and axial load carrying capabilities; the tapered-bore bearing and location; .4 the following seals: felt seal, rubbing seal, non-rubbing seal, lip seals and V-rig seals; .5 the lubrication of bearings, bushes, ball and roller bearings, the properties of the different lubricants. 14.1 Makes an engineering drawing employing: sections in 2		
Engineering drawing practice			

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

DRAWINGS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	parallel planes; revolved, thin, part, half sections; hidden detail; symbols; surface finish; angular and auxiliary dimensions; arrowheads; centre & leader lines; pitch-circle diameters; threads; hatching; enlarged views. 14.2 Uses applications as appropriate for units 1 to 13.		

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

GENERAL ENGINEERING SCIENCE/APPLIED MECHANICS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE.
MODULE 1			
<p>Understands the principles of mechanics with respect to statics, dynamics, kinematics and hydrostatics.</p> <p>1 Statics</p>	<p>1.1 Defines the following terms with the relevant formulated symbols:</p> <ul style="list-style-type: none"> .1 area, volume of figures and shapes; .2 mass, weight; .3 density, relative density and centre of gravity. <p>1.2 Defines:</p> <ul style="list-style-type: none"> .1 a moment, couple and equilibrium; .2 vectors and vector diagrams applicable to the triangle and polygon of forces. <p>1.3 Understands the action of concentrated loads on beams and cantilevers.</p> <p>1.4 Describes and defines, with the relevant symbols:</p> <ul style="list-style-type: none"> .1 Stress—tensile, compressive, shear; .2 Strain—Hooke's Law, elasticity, factor of safety, elastic limits, yield point, ultimate and breaking strength. 	<p>Examination and assessment of evidence obtained from theoretical instruction and associated laboratory equipment training.</p>	<p>Demonstrates a clear theoretical basis of mechanics.</p>
<p>2 Kinematics</p>	<p>2.1 Defines with the relevant symbols: distance, speed, acceleration, velocity, average velocity and relative velocity.</p> <p>2.2 Applies the formulae:</p> $V = u + at$ $V^2 = u^2 + as$ $S = ut + at^2/2$		
<p>3 Dynamics</p>	<p>3.1 Defines:</p> <ul style="list-style-type: none"> .1 with the relevant symbols: work, power, energy, 		

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

GENERAL ENGINEERING SCIENCE/APPLIED MECHANICS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE.
4 Hydrostatics	<p>force, force of gravity, inertia friction and coefficient of friction; kinetic and potential energy; Newton's 3 laws of motion. Applies the formula: force = mass x acceleration.</p> <p>4.1 Defines: .1 a fluid; .2 with the relevant symbols, pressure; atmospheric pressure; absolute pressure gauge pressure; liquid lead and vacuum; .3 the principles of floatation.</p> <p>4.2 Describes: .1 the operation and use of the following instruments: piezometer, manometer, barometer, Bourdon pressure gauge .2 the principles of hydraulic lifting machines; .3 the energies stored in liquids in motion pressure, kinetic and potential.</p> <p>5 States: .1 the volumetric flow is velocity x cross-sectional area; .2 the mass of flow is velocity x cross-sectional area x density.</p> <p>6 Describes: .1 the operations of simple lifting machines, screw jack, hydraulic jack, rope pulley blocks, work drivers and chain blocks; .2 the terms velocity ratio, mechanical advantage, efficiency.</p>		
5 Simple machines			

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

HEAT ENGINES/THERMODYNAMICS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
MODULE 1			
Understand the theoretical principles of Thermodynamics and Heat Engines in respect of the following principles			
1 Thermodynamic properties	<p>1.1 Defines the terms and relevant symbols: Heat, temperature and scales, calorific value, specific heat, pressure, volume, vapours expansion.</p> <p>1.2 Describes:</p> <ul style="list-style-type: none"> .1 linear and volumetric expansion; .2 enthalpy of fusion and enthalpy of evaporation. <p>1.3 Determines the amount of expansion due to heat action.</p> <p>2.1 Describes "internal" or "intrinsic" energy.</p> <p>2.2 Defines:</p> <ul style="list-style-type: none"> .1 kinetic and potential energy as molecular energy; .2 heat flow and work; .3 the first law of thermodynamics. <p>3.1 Defines heat transfer by conduction, convection and radiation.</p> <p>3.2 Describes laboratory equipment to determine specific heat capacity and final temperature.</p> <p>3.3 States Fourier's Law for conduction.</p> <p>3.4 Explains coefficient of thermal conductivity.</p> <p>4.1 Defines saturated, dry, wet, superheated vapours and dryness fraction.</p> <p>4.2 Describes the relationship between pressure and temperature for saturated liquids or vapours.</p> <p>4.3 Uses tables of thermodynamic properties (Steam tables) to determine values of enthalpy, internal energy, volume at</p>	Examination and assessment of evidence from theoretical instruction and associated laboratory equipment training.	Demonstrate a clear theoretical basis of Thermodynamics and Heat Engines.
2 Thermodynamic energy			
3 Heat transfer			
4 Vapour			

Part 2AA: Dra dm Code So Ma Qualifications

HEAT ENGINES/THERMODYNAMICS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
5 Ideal gases and gas cycles	<p>given pressures and/or temperatures.</p> <p>5.1 Defines critical temperature, ideal gas and perfect gas, ideal-gas cycle.</p> <p>5.2 States Boyle's and Charles's Law.</p> <p>5.3 Sketches P-V and V-T curves or graphs.</p> <p>5.4 Explains the following cycles with pressure-volume sketches: Otto, diesel, dual and Joule Cycles.</p> <p>5.5 Describes:</p> <ol style="list-style-type: none"> .1 the practical engines modelled on the cycles of 4 above; .2 single- and double-acting reciprocating engine applications; .3 the Rankine Cycle and state the effie ratio; .4 sketches the components of a steam plant: boiler, steam turbine, condenser and feed pump. 		
6 Thermodynamic process	<p>6.1 Defines a thermodynamic process in the forms of heat transfer and/or work transfer.</p> <p>6.2 Explains</p> <ol style="list-style-type: none"> .1 the Second Law of Thermodynamics; .2 P-V diagrams of the following standard processes: pressure remains constant, volume remains constant, temperature remains constant, zero heat transfer and polytropic expansion and compression. <p>6.3 Describes the following processes: isothermal as constant temperature adiabatic as a no heat transfer.</p>		
7 Work transfer	<p>7.1 Defines work with relevant symbols.</p> <p>7.2 Describes P-V diagrams relating to work done and work transfer for a vapour in terms of pressure and volume.</p>		
8 Heat engine cycles and internal combustion engines	<p>8.1 Describes:</p> <ol style="list-style-type: none"> .1 the 2 and 4 stroke internal combustion engines 		

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

HEAT ENGINES/THERMODYNAMICS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
9 Air compressors	<p>operation cycle with crank angles, port timing or valve timing;</p> <p>8.2 heat balance</p> <p>8.2 Determines:</p> <p>.1 the engine efficiency from energy input and energy output and energy losses and mechanical efficiency from brake and indicated power;</p> <p>.2 indicated power;</p> <p>8.3 Defines stroke, swept volume, compression ratio, mean effective pressure, indicated power, friction power, brake power.</p> <p>8.4 Sketches and describes indicator diagrams and the purpose of taking these diagrams.</p> <p>9.1 Describes the operation of an air compressor.</p> <p>9.2 States that $P_{in}(n) = \text{constant}$ and $\frac{PV}{T} = \text{constant}$ apply.</p>		
10 Combustion of fuels	<p>10.1 Describes the following terms : combustion, calorific value, flash point.</p> <p>10.2 Determines the minimum air required for complete combustion.</p>		

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>1 Diesel Module 1</p> <ol style="list-style-type: none"> .1 Safety in the workshop .2 Correct use of tools and equipment .3 Vernier and micrometer .4 Bolts and nuts .5 Fire triangle inside the engine .6 Diesel engine parts .7 Operation of the 4-stroke and 2 stroke cycle diesel engine .8 Stripping and assembling of C.I engines .9 Valve timing diagrams .10 Spill timing of compression ignition engines without timing marks .11 Fuel systems .12 Lift pumps .13 Injectors .14 Lubricating systems .15 Tune-ups .16 Cylinder head. 	<p>Identify measuring, checking, forming, cutting marking and fastening tools and tooling aids.</p> <p>Use a micrometer and vernier - outside, depth, inside, inside and outside. Use the following gauges: thread, feeler, dial, belt tensioner. Install lock-nuts, dowels, lock-plates, split pins, taper pins. Identify nuts and bolts.</p> <p>Tighten; torque and torque turn bolts and nuts.</p> <p>Use hydraulic press, maintain and operate hydraulic and mechanical jack.</p> <p>Identify types of filter elements: fuel filter, oil filter/by pass, high pressure oil filter / full flow. Low pressure oil filter.</p> <p>Trace and repair faults on worn and faulty components.</p> <p>Recall the operation of a four (4) and two (2) stroke cycle engine.</p> <p>Adjust engine tappets. Identify and recall the functions of the major components: cylinder head and rocker shaft assembly, cylinder block, camshaft and followers, crankshaft and bearings, connecting rod and followers, timing gear train, oil pump assembly, flywheel and dampers.</p> <p>Recondition cylinder head assemblies, measure crankshaft journals for taper and ovality, measure cylinder liners for taper and ovality.</p> <p>Dismantle, recondition and refit oil pumps Set valve and fuel injection timing.</p>	<p>Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (-e.g. simulation) using approved equipment.</p>	<p>Correctly identify all the tools and state all their physical characteristics.</p> <p>Standard holding technique to be maintained.</p> <p>Correct zeroing method applied. All measurements to be 100% correct.</p> <p>All burrs and rough edges, ground smooth.</p> <p>100 % correct according to manufacturer's procedures and specifications.</p> <p>All safety aspects adhered to. No tools or equipment damaged, all tools and equipment are clean.</p> <p>Correct according to manufacturer's lubrication and maintenance manual.</p> <p>Individual faults correctly traced and repaired.</p> <p>Correct procedures and tools used.</p> <p>Correctly identify all functions of major engine components.</p> <p>All measurements, clearances & torque valves & valve timing according to manufacturer's specifications and procedures.</p> <p>All measurements and clearances according to manufacturer's specifications and pump must run freely. All measurements, clearances, torque values and valve timing according to manufacturer's specifications.</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Diesel Module 2</p> <ol style="list-style-type: none"> .1 Safety .2 Cooling systems .3 Diesel engine lube oil system .4 Fuel systems .5 Turbocharger and blowers. .6 Engine sub-assembly reconditioning .7 Fault finding .8 Pre-start checks 	<p>Recall types of bearing failures and their causes.</p> <p>Cooling systems: Understand the functions of the water pump, thermostat, radiator, relief valve, fan and engine oil cooler.</p> <p>Remove, recondition and install water pumps.</p> <p>Remove and install an oil cooler and a thermostat.</p> <p>Fill cooling systems. Carry out pressure test on static cooling systems. Tests thermostat opening temperatures (outside machine). Add additives to a given cooling system.</p> <p>Fuel systems: know the functions of the following components: Primary filter, lift pump, injector. Explain the operation of a plunger and barrel in an inline injector pump.</p> <p>Know and understand the function and operation of a mechanical governor.</p> <p>Know how to bleed the fuel system, remove and test the injectors, time the fuel pump to engine, fit fuel filters.</p> <p>Dismantle, replace, adjust and calibrate components in various types of fuel systems.</p> <p>Trace faults and repair fuel systems and governors.</p> <p>Identify the main parts of a turbo charger: Turbine wheel, shaft compressor wheel, turbine centre and compressor housing. Understand the operation of a turbocharger. Remove and install turbo charger.</p> <p>Use machines safely.</p> <p>Comply with safe practices. Use safety equipment.</p>	<p>Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>All safety precautions recalled. Boiling point increases or decreases.</p> <p>Correct according to workshop manual procedures and specifications.</p> <p>All safety aspects adhered to. No fluid leaks.</p> <p>Correct level and all air expelled.</p> <p>Operation to include all four stages. All adjustments and calibrations according to manufacturer's specifications and procedures.</p> <p>Correct tools used and correct sequences adhered to.</p> <p>Indicate drive and driven side. Correct according to manufacturers' specifications.</p>
<p>2 Electrical Module 1</p>	<p>Use machines safely.</p> <p>Comply with safe practices. Use safety equipment.</p>	<p>Practical demonstration, written and/or oral questionnaire.</p>	<p>Specified start up and shut down procedures are correctly applied. Emergency procedures are</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
.1 Safety .2 Electrical laws .3 Electrical components .4 Measuring instruments	Explain the basic concept of electricity. Explain magnetic theory. Explain the basic fundamentals of power generation and distribution. Apply and explain electrical units and symbols. Identify and read fixed electrical measuring instruments. Identify and select portable electrical measuring instruments. Use and interpret electrical measuring instruments. Care for electrical measuring instruments.	Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.	carried out in accordance with company and legislative procedures and requirements. A safe and unsafe machine is recognised according to company safety standards. Machine safety devices are operational as laid down in company and legislative standards. All safety signs, codes and markings are identified against legislative and company standards. Specified uses of equipment are correctly described. Maintenance requirements are identified, regularly inspected and documented. Atomic structures are explained in terms of electrical materials. Electron flow in a conductor is explained with reference to electronic theory. The effect of an external power source on the electrons in a conductor is explained with reference to electronic theory. The principles of basic electrical circuits, voltage and current in an electrical circuit are explained in terms of a power source, a load and electron theory. Permanent magnet concept is explained in terms of molecular structure of materials. All five characteristics of magnetic lines of flux are explained in terms of magnetic theory. The relationship between magnetic field and current flow is explained in terms of movement, field strength and conductor length within the magnetic field. The electromagnet concept is explained in terms of magnetic lines of flux

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

WORKSHOP TRAINING			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
			<p>around a current carrying conductor and cores. The production of electricity is explained with reference to pressure, heat, light, friction, magnetism chemical. Generation of DC is explained in terms of a single loop in a magnetic field. single loop in a magnetic field. Generation of single phase AC is explained in terms of a single loop in a magnetic field. The relationship between voltage, current and resistance is explained in terms of Ohm's law. Factors influencing resistance is explained in terms of material type, length, diameter and temperature. Draw and interpret series, parallel and series-parallel DC resistive circuits & calculate variables. Series, parallel and series-parallel circuits are drawn and interpreted according to instructions. Resistance, voltage, current and power variances are interpreted and calculated in series circuits. Resistance, voltage, current and power variances are interpreted and calculated in parallel circuits. Resistance, voltage, current and power variances are interpreted and calculated in series-parallel circuits. Fixed electrical measuring instruments identified according to work...</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Electrical Module 2</p> <ol style="list-style-type: none"> 1 Soldering techniques and practice 2 Joints and splices: techniques and practice 3 Circuit wiring and colour codes 4 Circuit diagram interpretation 5 Electrical and electronic components 6 Constructions of basic control, power and electronic circuits. 7 Basic testing of circuit performance 	<p>Select equipment and materials for soldering/de-soldering. Apply soldering/de-soldering techniques. Inspect solder joint.</p> <p>Prepare for soldering. Perform soldering.</p> <p>Plan to conduct the jointing task. Prepare the work area. Joint low voltage cables. Test low voltage cables. Identify all types of contacts on the diagrams.</p> <p>Locate contacts of specific relays throughout the drawing.</p> <p>Distinguish power circuits from control diagrams. Describe the sequence of operation of relays/contactors and all components.</p> <p>Diagnose electrical faults.</p> <p>Identify electrical power-cables. Give examples of where power-cables are applied. Identify electrical</p>	<p>Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>marked for repair or replacement. Fixed measuring instruments are read correctly and readings recorded as per work site procedures</p> <p>Portable measuring instruments are selected to meet safety and job requirements.</p> <p>Measuring instruments are correctly set up for application. Electrical measuring instruments are handled in accordance with their specifications. Electrical measuring instruments are correctly applied to circuits and equipment when testing. Multimeters are set up for correct function and scale of measurement in accordance with manufacturers specifications.</p> <p>The correct soldering equipment is selected according to the job requirements. Hazards associated with the use of soldering equipment are recognized and necessary precautions taken according to work site procedures. Connections are carefully and correctly cleaned from dirt or oxidation using the appropriate cleaning materials.</p> <p>The correct soldering/de-soldering techniques for the job are used. Ensure that the soldered joints are not dull in colour and does not have excessive resin. Ensure that the soldered joints do not contain solder globules or insufficient solder that will cause a poor electrical or mechanical connection.</p> <p>Applicable soldering equipment selected as</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>8 Drawings and diagrams use</p> <p>.9 Principles of operation and use of electrical switchgear</p> <p>.10 Cables</p> <p>.11 Electrical testing instruments</p> <p>.12 Wiring of motor starters</p> <p>.13 Installation</p> <p>.14 Rotating electrical machines</p> <p>.15 Maintenance of equipment</p> <p>.16 Fault finding</p>	<p>control-cables. Give examples of where control-cables are applied.</p> <p>Identify electrical power contactors and electrical control relays.</p> <p>Explain terminology used in conjunction with electrical and electronic components. Demonstrate knowledge of linear resistance and resistors. Demonstrate knowledge of non-linear resistors. Demonstrate knowledge of capacitance and capacitors.</p> <p>Plan to install electrical cables and conductors.</p> <p>Install electrical cables and conductors.</p> <p>Terminate electrical cable/ conductors. Complete work task.</p> <p>Explain the requirements pertaining to the installation of a distribution board.</p> <p>Prepare and install distribution board.</p> <p>Prepare and test the distribution board for operation.</p> <p>Plan and prepare to maintain electrical motors, circuitry and controls.</p> <p>Maintain AC motors, circuitry and controls. Identify and repair faults on AC motors circuitry and controls.</p> <p>Replace any faulty components</p>		<p>required by task.</p> <p>Correct cable is identified and selected according to test, drawing and reticulation diagrams. Isolation of circuit is confirmed and tested as per safety standards. Cable ends are prepared for jointing according to manufacturer specifications. Cable cores are jointed according to manufacturer specifications and statutory requirements. Insulation test are carried out on completed joint.</p> <p>Components are all identified correctly first time. Contacts are all located correctly first time. Circuit diagrams are correctly identified as power circuit or control circuit in accordance with IEC standard.</p> <p>Sequence of operation is correctly explained in accordance with: The grid system, the component identification codes and the contact identification codes.</p> <p>A systematic, structured process of elimination is used to locate faults. No good components are discarded or damaged in the process.</p> <p>Cables and contactors are identified for size, type and colour according to their manufacturer's designation. Consequences of over or undersized cables and contactors are explained. Relays are identified correctly for size and type. Consequences of over or undersizing of relays is explained.</p> <p>The unit of resistance and its multiples are</p>

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

WORKSHOP TRAINING			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
			<p>defined, and symbols and terms are stated in line with accepted definitions and practice. Factors affecting resistance are explained. Factors must include: length, cross-sectional area, resistivity of material, temperature. Application of resistor is described in terms of control of voltage and current in electrical and electronic circuits. Demonstrate the knowledge of capacitance and capacitors. Electrical cables/conductors are installed, positioned and secured according to statutory requirements and worksite procedures. Tools and equipment are used safely to meet the requirements of the job. Cable gland is positioned; secured and assembled according to manufacturer's specifications (Armouring glanding, shroud, gland plate, compression gland. Ensure that all termination connections are secure and tight according to manufacturer's specifications and work site standards. The purpose of the equipment, signs and labels on the distribution board is explained with reference to safety. Hazards and risk directly related to the installation of a distribution board are identified and addressed in accordance with specified requirements. The distribution board is mounted in accordance with specified requirements. The integrity of the installation is tested in accordance with specified</p>

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

WORKSHOP TRAINING			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
<p>3 Fitting Module 1 .1 Electric drill press and drills .2 Files .3 Grinders .4 Hacksaw .5 Measuring equipment .6 Micrometers .7 Punches (heat treatment and sharpening) .8 Scriber .9 Square .10 Taps .11 Vernier callipers .12 Vernier height gauge</p>	<p>Select and use engineering measuring equipment: tapes, rules, combination set, spirit level, micrometers, dial gauges, feeler gauges, thermometers, scales, thread gauges, pressure gauges. Select appropriate power tool attachments for required application. Engineering power tools include drills (including pedestal drilling machines), grinders, sanders, brushes, buffs, wrenches, jacks, power and band saws. Discuss and explain basic engineering drawing concepts and material list. Select and use engineering hand tools: cutting and scrapers, hole punches, tin snips. Assembly hand tools include hammers, punches, clamps, vices, spanners, wrenches, pliers, screwdrivers. Identify and report unsafe or faulty tools; hand tool maintenance includes sharpening, resetting, de-rusting,</p>	<p>Practical demonstration, written and/or oral questionnaire. Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>requirements. Electric motors, circuitry and controls to be maintained are identified as per work site instructions. Safety and security lock-out system is applied. Plant is isolated electrically in accordance with work site procedures. Safe isolation of all circuits is verified and reasons for explained. Faultfinding is done by making use of logical method according to faultfinding techniques. Basic units of measure, symbols and derived units of measure are explained. Measurements taken are appropriate to scale of measuring device. Symbols used are relevant to measurement. Appropriate measuring equipment selected for job. A clean and tidy work environment is maintained. Measuring equipment used as recommended by the manufacturer to meet job/task requirement. Measurements are taken and recorded. Correct safety precautions taken while using power tools. Appropriate power tools selected for job. Appropriate attachments selected for particular application. A clean and tidy work environment is maintained. Engineering drawings are correctly interpreted, taking into account line structures, dimensions and projections. Interpretation done in a methodical manner. Correct safety precautions</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Fitting Module 2</p> <ol style="list-style-type: none"> .1 Bearings .2 Dial test indicator .3 Motor and shaft .4 Pump and motor .5 V-Belt .6 Chain drives .7 Pumps and valves: stripping and assembling gland packing cutting and fitting of gaskets .8 Identification, inspection, 	<p>oil.</p> <p>Plan and prepare for bearing replacement. Bearings include anti-friction bearings and plain types. Anti-friction bearings include (single and double thrust) and roller (needle, spherical, taper) types. Plain bearings include plain, wrapped, flanged, split and thrust types in brass, bronze, white metal, phosphor bronze, aluminium and synthetics. Prepare site and equipment for bearing replacement: site and equipment preparation includes isolating equipment electrically, mechanically and from other energy sources. Check bearing in situ: bearing loading includes axial, radial and combination of these. Inspect bearing while machine is in operation and static. Inspect and assess pump condition. Identify problems and take corrective action. Problems include low pressure, excessive heat, and vibration.</p>		<p>taken while using hand tools. Appropriate hand tools selected for Job A clean and tidy work environment is maintained.</p> <p>Site and equipment are prepared for bearing replacement. Bearing serviceability is determined in situ. Bearings are removed and inspected. Bearings are installed. Site and equipment are prepared for pump maintenance. Pump is maintained to specifications. Pump is checked for compliance with operational requirements. Pump condition is recorded and reported. Work is carried out in a safe manner in accordance with schedules and manufacturer specifications. A clean and tidy work environment is maintained.</p>
<p>4 Machining Module 1</p> <ol style="list-style-type: none"> .1 Boring .2 Drilling include centre drilling, counter bore, counter sinking, tapping and reaming. .3 Three jaw chuck work .4 Grinding and wheel dressing 	<p>Prepare for work activity: Interpret drawings and job instructions and determine sequence of operations. Prepare machine for operation including lubrication, routine maintenance and pre-operational checks. Check materials and tools required are at workstation. Set drilling, milling machine and lathe: Select and install required accessories and work holding fixtures. Select, prepare and install required tools. Select and set</p>	<p>Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>Machine is set up to accept work safely and without damage to work piece or machine. Accessories and work holding fixtures are appropriate to task. Tools selected are appropriate to material type and safety requirements. Cutting speed and feeds selected are appropriate to machine, material and tooling. Materials are prepared and correctly</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
5 Measuring equipment .6 Parallel turning .7 Taper turning .8 Tool sharpening and grinding .9 Milling: flat machining, square machining, blocking, step cutting and slot cutting, keyway cutting	cutting speeds and feeds. Perform drilling, milling, grinding and turning operations: Start and shut down drilling, milling, grinding machine and lathe. Monitor drilling, milling, grinding machine and lathe while in operation, making adjustments to speeds and feed where required. Remove machined component on completion of drilling, milling, grinding and turning process. Set grinding machine: select and install required accessories and work holding fixtures. Select and mount grinding wheels. Dress and balance grinding wheels.		marked out if required. Machine operating instructions and worksite procedures are adhered to. Adjustments during drilling, milling, grinding and turning process are made quickly and appropriately. Safe working practices are adhered to. Components are measured and conformance to specification documented. A clean and tidy work environment is maintained. Grinding wheels selected and mounted are appropriate to material type and safety requirements. Table speeds and feeds selected are appropriate to machine, material and tooling.
Machining Module 2 .1 Boring parallel internal .2 Four jaw chuck work .3 Screw cutting: V-threads (male and female) and square threads (male and female) .4 Taper turning external and internal, mandrel work.	Set lathe: Select and install required accessories and work holding fixtures. Select, prepare and install required tools. Select and set cutting speeds and feeds. Perform turning operations: Start and shut down lathe. Monitor lathe while in operation, making adjustments to speeds and feed where required. Remove machined component on completion of turning process. Select and prepare appropriate measuring equipment. Measure component. Recognise changes and/or malfunctions while operating.		
5 Welding Module 1 .1 SAFETY Workshop	Discuss and explain procedures for dealing with safety, health and environmental emergencies or incidents in the workplace and minimise damage or injury. Identify the nature of an incident and the relevant	Practical demonstration, written and/or oral questionnaire. Practical exercises and instruction conducted	Nature of incident and appropriate emergency procedure identified. Relevant emergency service is notified. Emergency procedures are carried out. Emergency work is carried out in

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Gas cylinders Machines Welding</p> <p>2. PERSONAL Clothing Lighting up Closing down Rings and watches Ventilation</p> <p>3. PRACTICAL Arc welding Gas welding Brazing Oxy-acetylene soldering</p> <p>4. THEORY Apparatus knowledge Design factors Gas cylinders Strength and weakness Technique</p>	<p>emergency procedure. Describe the preparation and assembling of welding/cutting equipment. Identify, select, and prepare, welding/cutting equipment. Assemble welding/cutting equipment. Plan the preparation process for the job. Identify and select tools and equipment. Prepare work pieces for welding. Describe and explain the oxyacetylene gas welding process. Prepare Oxy-fuel brazing equipment. Prepare work pieces prior to brazing. Brazing work piece. Select, assemble and conduct pre operational checks of oxyacetylene gas welding equipment. Prepare work pieces prior to welding. Weld metals with oxyacetylene gas welding process. Describe the shielded metal arc welding process. Prepare work pieces prior to welding. Weld work piece.</p>	<p>under approved and truly realistic training conditions (e.g. simulation) using approved equipment. Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>a calm and timely manner. Communication with relevant emergency personnel and personnel is clear and to the point. Basic and major components of the welding/cutting equipment are identified and the explanation of function and purpose is correct in terms of manufacturer's specifications and requirements. Welding machines and equipment are correctly identified in relation to welding processes. Work pieces prepared in accordance with work instruction sheet and drawing. Pre-operational checks on tools and equipment are carried out in accordance with operations manuals and manufacturer's specifications. The importance of correct assembly of oxy-fuel gas brazing equipment is explained with reference to the manufacturer requirements. Components of the oxyacetylene gas brazing equipment are identified and the explanation of function and purpose is correct in terms of manufacturer's requirements and standards. Terms and definitions used are consistent with generally accepted brazing terminology. Work pieces are identified and prepared prior to brazing as specified on drawing. Work piece tack welding in position as per drawing specifications. Inspect work piece prior to complete brazing in accordance with drawing and work instructions.</p>

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

WORKSHOP TRAINING			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
			<p>Brazing filler material selected as specified on brazing procedure specification. Work-piece brazed in position. Flame used is compatible to type of material to be brazed. The importance of correct assembly of the oxyacetylene gas welding equipment, and the consequences of incorrect assembly is explained. Components of the oxyacetylene gas welding equipment are identified and the explanation of function and purpose is correct in terms of manufacturer's requirements and standards. Parts and components correctly identified and the implications for not testing for leaks are explained. Terms and definitions used are consistent with generally accepted welding terminology. Pre operational checks are carried out in accordance with vendor specifications and to be leak free. Weld metals with oxyacetylene gas welding process. Workpiece welded in position. Safety precaution adhered to during welding process The importance of correct assembly of the shielded metal arc welding equipment, and the consequences of incorrect assembly is explained. Components of the shielded metal arc welding equipment are identified and the explanation of function and purpose is correct in terms of manufacturer's requirements and standards.</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>6 Sheet metal and pipe Module 1</p> <p>1 SAFETY Workshop Hand tools Machines</p> <p>2 PERSONAL Clothing Correct gear Lighting up Closing down</p> <p>3 DRAWINGS Marking off Reading of technical drawings Setting out Wastage</p>	<p>Discuss and explain procedures for dealing with safety, health and environmental emergencies or incidents in the workplace and minimise damage or injury. Identify the nature of an incident and the relevant emergency procedure.</p> <p>Prepare for work activity: Mark off workpiece according to the job requirements. Identify potential hazards and take preventative action. Equipment includes bending rolls and bending presses. Material types include low carbon and alloy steels, stainless steels, aluminium alloys and copper alloys. Material thickness ranges from 0.4 to 6 mm. Form and shape material: Adjust machine settings; carry out forming and shaping operations. Apply safe working practices and discuss issues related to safety of self, fellow workers, machines. Describe and explain the oxy-fuel pipe cutting process of low carbon steel pipes.</p>	<p>Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>Parts and components correctly identified and the implications for incorrect identification explained. Work pieces prepared prior to welding as specified on drawing. Welding electrodes selected as specified on welding procedure specification. Workpiece welded in position. Safety precaution adhered to during welding process.</p> <p>Nature of incident and appropriate emergency procedure identified. Relevant emergency service is notified. Emergency procedures are carried out. Emergency work is carried out in a calm and timely manner. Communication with relevant emergency personnel and personnel is clear and to the point.</p> <p>Job instructions are correctly interpreted and complied with. Operations are correctly sequenced. Correct equipment and tools are selected. Equipment is set up to work safely and without damage to workpiece or equipment. Material limitations are evaluated correctly. Workpiece is correctly marked off. Machines are correctly adjusted. A clean and tidy work environment is maintained.</p>

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

WORKSHOP TRAINING			
COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
<p>4 CONSTRUCTION Bending up Edging Rolling</p> <p>5 PRACTICAL Gas equipment Flame setting Technique Plate and pipe cutting Plate handling</p>	<p>Prepare for the oxy-fuel cutting operation. Cut plate and pipe to job requirement.</p>		<p>The importance of correct setting of cutting pressure, and the consequences of incorrect settings, is explained with reference to the pipe and plate thickness, size of cutting nozzles and process. Basic and major components of the cutting cutting device and equipment are identified. Cutting characteristics of materials are correctly identified and the implications for unsafe conditions are accurately described. Gas pressures are set according to wall thickness of pipe or plate. Cutting speed is controlled on relation to wall thickness of pipe or plate. Cutting is carried out in accordance with the work instruction sheet and drawing requirements. End product conforms to the job requirements and drawing specifications. System is ensured to be safe. System non-conformance are identified. System maintenance activities are performed. Plant care service. Maintained components are replaced without damage to the component or system. Removed components are serviced using appropriate tools and equipment. Accumulator pre-charge pressures are visually</p>
<p>7 Hydraulic Module 1</p> <p>.1 Theory and principles of power Hydraulic transmission of</p> <p>.2 hydraulic symbols and the reading of schematic diagrams</p> <p>.3 Layout and explanation of a basic hydraulic system</p> <p>.4 Construction, principles</p>	<p>Work safely with due care for self, workers, equipment, materials and environment. Obtain documentation, interpret engineering drawings, maintain schedules and procedures and select appropriate tools and equipment. Isolation, depressurisation and use protective equipment. Apply quality checks on completed work. (Quality checks include commissioning system and inspecting for leaks, coolant levels.</p>	<p>Practical demonstration, written and/or oral questionnaire. Practical exercises and instruction conducted under approved and truly realistic training conditions (eg simulation) using approved equipment.</p>	

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
and application of: Hydraulic pump and motors. Pressure control valves Flow control valves Directional control valves Hydraulic actuators Fluids, filters and filtration Reservoirs and coolers Accumulators .5 Simple circuit design and construction of circuits on simulators .6 Basic maintenance and faultfinding procedures	Care for and store maintenance tools and equipment. Report on system condition.		checked. Work is carried out in a safe manner in accordance with schedules and manufacturer specifications. A clean and tidy work environment is maintained.
8 Pneumatics Module 1 .1 Air service units .2 Analysis and fault finding procedures .3 Operation, construction and application components .4 Pneumatic circuits and diagram interpretation .5 Pneumatic symbols .6 Theory and physical principles related to pneumatics	Work safely with due care for self, workers, equipment, materials and environment. Obtain documentation, interpret engineering drawings, maintain schedules and procedures and select appropriate tools and equipment. Isolation, depressurisation and use protective equipment. Apply quality checks on completed work. (Quality checks include commissioning system and inspecting for leaks, coolant levels. Care for and store maintenance tools and equipment. Report on system condition.	Practical demonstration, written and/or oral questionnaire. Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.	System is ensured to be safe. System non-conformance are identified. System maintenance activities are performed. Plant care checks are undertaken. System is returned to service. Maintained components are replaced without damage to the component or system. Removed components are serviced using appropriate tools and equipment. Accumulator pre-charge pressures are visually checked. Work is carried out in a safe manner in accordance with schedules and manufacturer specifications.

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

WORKSHOP TRAINING

COLUMN 1 COMPETENCE	COLUMN 2 KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	COLUMN 3 METHODS FOR DEMONSTRATING COMPETENCE	COLUMN 4 CRITERIA FOR EVALUATING COMPETENCE
<p>9 Refrigeration Module 1</p> <p>1 WORKSHOP SAFETY Workshop Refrigerants</p> <p>2 THEORY Evacuating Recovery and recycling Specialist tools and equipment System components Types of systems</p> <p>3 PRACTICAL Evacuation Pressure testing and leak detecting Refrigerant charging Replacement of components Servicing and maintenance Trouble-shooting</p>	<p>Define temperature and heat and explain the different forms of heat. Define pressure and explain the different pressures. system and its functions. State and describe the commonly used control systems based on their energy source State and describe the three types of control devices used on air conditioning and refrigeration systems. State and describe the commonly used types of measuring elements and sensors Measure or determine and define the operating parameters of refrigeration systems. Compare the observations with the design parameters for the plant or with normally expected operating parameters. Explain with the aid of a block diagram the operation of the vapour compression refrigeration system. Name and indicate the components and pipes in the block diagram drawn and indicate the direction of flow. The direction of flow of refrigerant, air and water is correctly indicated. Explain the process taking place in each component. Discuss the relationship between the pressure and the temperature of a refrigerant. Identify and explain the function on components and accessories of a refrigerant system.</p>	<p>Practical demonstration, written and/or oral questionnaire.</p> <p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. simulation) using approved equipment.</p>	<p>A clean and tidy work environment is maintained.</p> <p>Temperature and heat are defined and the difference illustrated. Sensible heat and latent heat are defined and examples are given. The three phases of matter are stated and the names for changes are listed. The terms absolute pressure, barometric pressure, gauge pressure and vacuum are defined and explained. A control system is defined and its main parts are named. Terms used to describe the function and operation of a control system are listed and discussed. The commonly used variables that are controlled in a refrigeration system are demonstrated. The three types of control devices used on refrigeration systems are stated. The types of measuring elements and sensors used are listed and described. The control devices are correctly connected. The control devices are correctly set to stated parameters. Operation of the control devices is checked. Possible malfunctions are identified and listed. Correct block diagrams of the vapour</p>

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

WORKSHOP TRAINING			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	Handle and store refrigeration system components and accessories.		<p>compression refrigeration system are drawn. The operation of a vapour compression system is explained Each component is indicated and named correctly. The processes taking place in the components are explained and demonstrated correctly. The phases and temperature of the refrigerant at the inlet and outlet of all components is stated correctly. The temperature of the refrigerant and the water at the inlet and outlet of all components is stated correctly. The relationship between the pressure and the temperature of the refrigerant is stated correctly. The various components and accessories of a Refrigerant system is correctly identified and their position in a refrigeration plant is indicated. The gauge manifold is connected correctly and hoses are purged. Superheat and sub cooling deviations are noted, discussed and explained. The desirability of superheat and sub cooling is explained. Reasons for high or low temperature or pressure reading are explained.</p>

*Part 2B: Draft Merchant Shipping (Training and Certification)
Amendment Regulations, 2006 (No. 2)*

Part 2B Draft Merchant Shipping (Training and Certification) Amendment Regulations, 2006 (No. 2)

1 Title and commencement

- (1) These regulations are called the *Merchant Shipping (Training and Certification) Amendment Regulations, 2006 (No. 2)*.
- (2) These regulations commence on 1 January 2007.

2 Definitions

In these regulations "the Regulations" means the *Merchant Shipping (Training and Certification) Regulations, 1999*, published by Government Notice No. R. 1547 of 30 December 1999, as amended by Government Notices Nos, R. 502 of 26 April 2002, and 1196 and 1197 of 15 October 2004, and <<the *Merchant Shipping (Training and Certification) Amendment Regulations, 2006 (No. 1)*>>.

3 Amendment of regulation 1 of Regulations

Regulation 1 of the Regulations is amended by the substitution in subregulation (1) for the definition of "fishing vessel" of the following definition:

"fishing vessel" means a vessel that is used wholly or principally for the taking, catching or capturing of fish or other living resources of the sea or seabed for financial gain or reward;"

4 Amendment of regulation 43 of Regulations

Regulation 43 of the Regulations is amended by the addition of the following ALTERNATIVE:

"or

ALTERNATIVE D

(if the candidate holds the certificate of qualification as able seaman (fishing))

- (a) have completed, while holding as a minimum the certificate of qualification as able seaman (fishing),

***Pari 28: Draft Merchant Shipping (Training and Certification)
Amendment Regulations, 2006 (No. 2)***

- at least **six** months port operations service in the deck department on ships of 100 GT or more; and
- (b) have completed, during the required port operations service, onboard training that is documented in **an** approved **training** record book; and
- (c) have completed approved training and meet the standard of competence specified in the Code."

5 Amendment of regulation 43A of Regulations

Regulation **43A** of the Regulations is amended by the addition of the following **ALTERNATIVE**:

"or

ALTERNATIVE

(if the candidate holds the certificate of qualification as able seaman fishing))

- (a) have completed, while holding **as** a minimum the certificate of qualification **as** able seaman (fishing), at least six months sea service in the deck department on trading ships of 100 GT or more on unlimited or near-coastal voyages; and
- (b) have completed, during the required sea service, onboard training that is documented in **an** approved training record book; **and**
- (c) have completed approved training and meet the standard of competence specified in the Code."

6 Amendment of regulation 60 of Regulations

Regulation **60** of the Regulations is amended by the insertion of the following subregulations **after** subregulation (2):

"(2A) Subject to subregulation (2B), the holder of certification specified in column **1** of an item in the following table may apply to the Authority for the certification specified in column **2** of the item:

Item	Column 1 <i>Certificate of competency</i>	Column 2 <i>Endorsement in terms of these regulations</i>
1	Unlimited Waters Command Endorsement	Master of a ship of less than 200 GT on unlimited voyages

*Part 26: Draft Merchant Shipping (Training and Certification)
Amendment Regulations, 2006 (No. 2)*

Item	Column 1	Column 2
	<i>Certificate of competency</i>	<i>Endorsement in terms of these regulations</i>
2	Skipper (Fishing \geq 24 metres)	Master of a ship of less than 500 GT on near-coastal voyages
3	Deck Officer (Fishing \geq 24 metres)	Chief mate/officer in charge of a navigational watch on ships of less than 500 GT on near-coastal voyages
4	Skipper (Fishing < 24 metres)	Master of a ship of less than 200 GT on near-coastal voyages Master of a ship of less than 200 GT operating within a port operations area

(2B) However, if the certification held by the candidate is the certification issued **in terms** of regulation 4(2) of the *Merchant Shipping (Training and Certification) (Fishing and Marine Motorman Qualifications) Regulations, 2006*, the candidate shall—

- (a) have completed approved training, appropriate to the endorsement desired, covering the following syllabuses in the Code: naval architecture; business law and personnel management; and, for the certification mentioned in item 1 of *the* table in subregulation (2A), ships' power plants; and
- (b) meet the **standard** of competence specified in the Code."

7 Amendment of regulation 71 of Regulations

Regulation 71 of the Regulations is amended by the deletion of subregulation (2).

*Part 28: Draft Merchant Shipping (Training and Certification)
Amendment Regulations. 2006 (No. 2)*

Explanatory note

(This note is not part of the regulations)

- 1 These regulations amend the *Merchant Shipping (Training and Certification) Regulations, 1999*, made under section 356 of the *Merchant Shipping Act, 1951*.
- 2 The amendments are consequential upon the making of the *Merchant Shipping (Training and Certification) (Fishing and Marine Motorman Qualifications) Regulations, 2006*, which overhaul the training and certification requirements **and** arrangements for seagoing fishing vessel personnel and certain **other** non-STCW engine department personnel.
- 3 The main object of the amendments is to make provision about the transportability of fishing vessel service and qualifications into the port operations and merchant shipping environments.

*Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No.2)*

Part 2 C Draft Merchant Shipping (Safe Manning) Amendment Regulations, 2006 (No. 2)

1 Title and commencement

- (1) These regulations are called the *Merchant Shipping (Safe Manning) Amendment Regulations, 2006 (No. 2)*.
- (2) These regulations commence on **1 January 2007**.

2 Definitions

In these regulations "**the Regulations**" means the *Merchant Shipping (Safe Manning) Regulations, 1999*, published by Government Notice No. 1548 of 30 December 1999, **as** amended by Government Notices Nos. R. 501 of 26 April **2002** (**as** corrected by Government Notice No. R. 893 of 28 June 2002), R. 545 of 30 April 2004 and <<*Merchant Shipping (Safe Manning) Amendment Regulations, 2006 (No. 1)*>>.

3 Amendment of regulation 1 of Regulations

Regulation 1 of the Regulations is amended—

- (a) by the deletion in subregulation (1) of the definition of "defined fishing zone";
- (b) by the substitution in subregulation (1) for the definition of "fishing vessel" of the following definition:

"**fishing vessel**' means a vessel that **is** used wholly or principally for the taking, catching or capturing of fish or other living resources of the sea or seabed for financial gain or reward;";
- (c) by the insertion in subregulation (1) after the definition of "length" of the following definition:

"**limited waters**', in relation to a fishing vessel, has the same meaning as in regulation 2(1) of the *Merchant Shipping (Training and Certification) (Fishing and Marine Motorman Qualifications) Regulations, 2006*"; and
- (d) by the insertion in subregulation (1) after the definition of "unlimited voyage" of the following definition:

"**unlimited waters**', in relation to a fishing vessel, has the same meaning **as** in regulation 2(1) of the *Merchant Shipping (Training and Certification) (Fishing and Marine Motorman Qualifications) Regulations, 2006*";

*Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)*

4 Substitution of regulation 12 of Regulations

The following regulation is substituted for regulation 12 of the Regulations:

"12 Employment of certificated deck officers on fishing vessels

The owner and the master of every fishing vessel shall ensure that there is employed on the vessel in their appropriate capacities the number and description of appropriately certificated deck officers specified in the applicable item of the following table:

Item	Type of voyage	Length of vessel (metres)	Capacity of employment	Appropriate minimum certification and number of persons to be employed	
				Certification	Number
1		< 24	Master	Skipper (Fishing < 24 metres)	1
			Mate	Deck Officer (Fishing < 24 metres)(B)	1(A)
2	Limited waters	≥ 24	Master	Skipper (Fishing ≥ 24 metres)	1
			Mate	Deck Officer (Fishing ≥ 24 metres)	1
			Watchkeeping officer	Deck Officer (Fishing ≥ 24 metres)	1

**Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)**

Item	Type of voyage	Length of vessel (metres)	Capacity of employment	Appropriate minimum certification and number of persons to be employed	
				Certification	Number
3	Unlimited waters	< 24	Master	Skipper (Fishing < 24 metres) with Unlimited Waters Command Endorsement	1
			Mate	Deck Officer (Fishing < 24 metres)	1
			watchkeeping officer	Deck Officer (Fishing < 24 metres)(B)	1
4		≥ 24	Master	skipper (Fishing ≥ 24 metres) with Unlimited Waters Command Endorsement	1
			Mate	Deck Officer (Fishing ≥ 24 metres)	1
			Watchkeeping officer	Deck Officer (Fishing ≥ 24 metres)	1

Notes:
A) Not required for vessels < 50 GT going to sea for periods not exceeding 12 consecutive hours.
B) Or Coastal Skipper (> 9 metres).

5 Repeal of regulation 13 of Regulations

Regulation 13 of the Regulations is repealed.

6 Substitution of regulation 15 of Regulations

The following regulation is substituted for regulation 15 of the Regulations:

"15 Employment of certificated engineer officers on fishing vessels

The owner and the master of every fishing vessel shall ensure that there is employed on the vessel in their appropriate capacities the number and description of appropriately certificated engineer officers specified in the applicable item of the following table:

Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)

Item	Propulsion power of vessel (kW)	Capacity of employment	Appropriate minimum certification and number of persons to be employed	
			Certification	Number
1	< 350	Chief engineer	Marine Motorman Grade 2	1
2	≥ 350 but < 750	Chief engineer	Marine Motorman Grade 2	1
		Second engineer	Marine Motorman Grade 2	1
	≥ 750 but < 2000	Chief engineer	Marine Motorman Higher Grade	1
		engineer	Marine Motorman	1
		Watchkeeping officer	Marine Motorman Grade 2	1(A)
4	≥ 2000	Chief engineer	Chief Engineer Officer (Fishing)	1
		Second engineer	Marine Motorman Higher Grade	1
		Watchkeeping officer	Marine Motorman Grade 1	1

Notes:
(A) Not required on fishing vessels operating in limited waters."

7 Amendment of regulation 16 of Regulations

Regulation 16 of the Regulations is amended by the substitution for the existing table of the following table:

Item	Voyage	Tonnage / Length of ship	Appropriate certification and number of persons to be employed	
			Certification	Number
<i>Ships other than fishing vessels</i>				
1	Port operations	≥ 25 GT	Restricted Radiotelephone Operator	1
2	Near	1.25 GT but < 300 GT	Restricted Radiotelephone Operator	2
3		≥ 300 GT	GMDSS General Operator	2
4	Unlimited	≥ 25 GT but < 300 GT	Restricted Radiotelephone Operator	2
5		≥ 300 GT	GMDSS General Operator	2
6	Limited waters within 12 nautical miles off-shore	≥ 25 GT	Restricted Radiotelephone Operator (VHF only)	1

**Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)**

Item	Voyage	Tonnage/ Length of ship	Appropriate certification and number of persons to be employed	
			Certification	Number
7	Limited waters beyond 40 nautical miles offshore	≥ 25 GT	Restricted Radiotelephone Operator	2
8	Unlimited waters	< 45 metres	Restricted Radiotelephone Operator	2
9		≥ 45 metres	GMDSS General Operator	2".

8 Substitution of regulation 18 of Regulations

The following regulation is substituted for regulation 18 of the Regulations:

"18

Item	Number of person on vessel	Minimum certification and number of persons to be employed		
		Able seaman	Proficient in survival craft	Efficient cook
1	≥ 15 but < 30	1	1	—
2	≥ 30	1	2	1

9 Amendment of regulation 23 of Regulations

Regulation 23 of the Regulations is amended—

- (a) by the insertion in the table in subregulation (1)(b) after item 20 of the following item:

**Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)**

	Column 1	Column 2	Column 3
"Item	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
20A	—	Fisherman Grade 2 with High Seas Command Endorsement	Skipper (Fishing \geq 24 metres) with Unlimited Veterans Command Endorsement";

- (b) by the substitution in the table in subregulation(1)(b) for ~~item~~ 21 of the following item:

	Column 1	Column 2	Column 3
"Item	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
21	Skipper of a fishing, sealing or shore-based whaling boat of 100 GT or more	Fisherman Grade 2	Skipper (Fishing \geq 24 metres)";

- (c) by the insertion in the table in subregulation (1)(b) after item 21 of the following item:

	Column 1	Column 2	Column 3
"Item	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
21A	—	Fisherman Grade 3 with High Seas Command Endorsement	Deck Officer (Fishing \geq 24 metres) endorsed: —Master of a fishing vessel of less than 30 metres in length operating in unlimited waters";

- (d) by the substitution in the table in subregulation(1)(b) for item 22 of the following item:

*Part 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)*

	Column 1	Column 2	Column 3
"Item	Title of certificate Issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
22	Mate of a fishing, sealing or shore-based whaling boat of 100 GT or more	Fisherman Grade 3	≥ 24 metres) endorsed: — Master of a fishing vessel of less than 30 metres in length operating in limited

(e) by the insertion in the table in subregulation (1)(b) after item 22 of the following items:

	Column 1	Column 2	Column 3
"Item	Title of certificate Issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
22A	—	Fisherman Grade 4 (Skipper) with High Seas Command Endorsement	Skipper (Fishing < 24 metres) with Unlimited Veterans Command Endorsement";
22B	—	Fisherman Grade 4 with High Seas Command Endorsement	

	Column 1	Column 2	Column 3
"Item	Title of certificate Issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
23	Boatswain of a fishing, sealing or shore-based whaling boat of 100 GT or more	Fisherman Grade 4 (Skipper)	Skipper (Fishing < 24 metres)
24	Skipper of a coasting ship or a fishing sealing or shore-based whaling boat of less than 100 GT		

*Patt 2C: Draft Merchant Shipping (Safe Manning)
Amendment Regulations, 2006 (No. 2)*

Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
25	Mate of a coasting ship or a fishing, sealing or shore-based whaling boat of less than 100 GT	Fisherman Grade 4 (Watchkeeper)	(a) Deck Officer (Fishing < 24 metres); or (b) if seagoing service has been performed on ships ≥ 24 metres in length: Deck Officer (Fishing < 24 metres) endorsed: —Officer in charge of a navigational watch on fishing vessels of 24 metres or more in length operating in limited waters
26	—	Fisherman Grade 4	kipper (Fishing < 24 metres)';

(g) by the substitution in the table in subregulation (1)(b) for item 29 of the following item:

Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
29	—	Marine Engineer-Officer Class 3 with Service Endorsement	(a) Second Engineer Officer (< 3 000 kW) endorsed: —Chief Engineer Officer of a ship of less than 750 kW propulsion power -Chief Engineer Officer of a ship of any kilowatt propulsion power operating within port operations mea (b) Chief Engineer Officer (Fishing)';