

Deck Competency Tables

Table II/1

Specification of minimum standards of competence for Master Class 3

Function: Navigation

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Steer the vessel and comply with helm orders	<ol style="list-style-type: none"> 1. Knowledge of magnetic compass. 2. Knowledge of steering system on Inland vessels. 3. Helm orders and steering steady courses. 	Assessment of evidence obtained from one or more of the following: <ol style="list-style-type: none"> 1. approved in-service experience (TAR Book). 2. practical test 	A steady course is steered. Course alterations are smooth and controlled.
Maintain a safe navigational watch	<i>Watchkeeping</i> <ol style="list-style-type: none"> 1. Basic knowledge of Rules of the Road as per IWAJ Act. 2. Knowledge of the principles to be observed in keeping a navigational watch. 3. Navigation near barrages, dams, canals and rivers. 4. Knowledge of tide and currents. 5. Knowledge of buoyage system. 6. Knowledge of writing log books and weather reports. 7. Knowledge of rivers, canals and waterways 	Assessment of evidence obtained from approved in-service experience. (TAR Book).	<p>The conduct, handover and relief of the watch conforms with accepted principles and procedures.</p> <p>A proper look-out is maintained at all times and in conformity with accepted principles and procedures.</p> <p>Lights, shapes and sound signals conform with the requirements contained in the Regulations and are correctly recognized.</p> <p>The frequency and extent of monitoring of traffic, the vessel's position</p>

			<p>and the environment conforms with accepted principles and procedures.</p> <p>Action to avoid close encounters and collision with other vessels is in accordance with the collision regulations.</p> <p>A proper record is maintained of movements and activities relating to the navigation of the vessel.</p>
Respond to emergencies	<p><i>Emergency procedures:</i></p> <ol style="list-style-type: none"> 1. Precautions for the protection and safety of passengers in emergency situations 2. Initial assessment of damage and damage control 3. Action to be taken following a collision /grounding 4. Action to be taken on engine / steering failure 5. Rescuing persons from the water 	<p>Assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience (TAR Book). 2. practical instruction 	<p>The type and scale of the emergency is promptly identified. Initial actions appropriate to the urgency of the situation and the nature of the emergency are taken. Awareness of the company instructions on emergency handling.</p>
Respond to a storm, and distress signal	<p>Knowledge of Storm, Distress and Emergency signal.</p>	<p>Assessment of evidence obtained from practical instruction.</p>	<p>The storm, distress or emergency signal immediately recognized and acted upon in accordance with instructions and standing orders of the company and or competent authority.</p>

Function: Cargo Handling and stowage

Manoeuver the vessel	<p>Knowledge of Vessel manoeuvring and handling in rivers and channels-</p> <ol style="list-style-type: none"> 1. Turning circles and stopping distances. 2. Turning an Inland Vessel 3. Proper procedures to bring the vessel to an anchor and get underway. 4. Proper procedure to bring her to jetty, pier or wharf and casting off. 	<p>Assessment of evidence obtained from approved in-service experience. (TAR Book).</p>	<p>Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuver</p> <p>Adjustments made to the vessel course and speed to maintain safety of navigation.</p>
----------------------	---	---	---

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor the loading, stowage, securing, care during the voyage and unloading of cargoes.	<ol style="list-style-type: none"> 1. Knowledge of cargo safety, cargo stowage, handling and securing of cargoes including liquid cargo. 2. Importance of ventilation during voyage. 3. Types of hatches & their operations. 4. Transfer of Cargo and Bunkering operations etc. 	Examination oral/written	Cargo operations are carried out in accordance with the cargo plan or other documents.

Function: communications

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence

Communication with shore radio stations and other vessels using VHF	<i>VHF operation</i> Knowledge of procedures appropriate to the vessels concerned and the operations on which they are engaged.	Examination and assessment of evidence obtained from in-service experience.	Operational and emergency communications are carried out in accordance with operational instructions and emergency or contingency plans
---	--	---	---

Function: Controlling the operation of the vessel and care for persons on board

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ensure compliance with pollution prevention requirements	<i>Prevention of pollution of the marine environment and anti-pollution procedures.</i> Knowledge of the precautions to be taken to prevent pollution of the marine environment. Knowledge of prohibition of dumping anything in water. Knowledge of anti-pollution procedures and use of associated equipment.	Examination oral/written	Procedures for monitoring onboard operations and ensuring compliance with anti-pollution requirements are fully observed.
Maintain seaworthiness of the vessel	<i>Vessel stability</i> Basic intact stability, COG, COB, GM. Factors that affect List and trim. Actions to be taken in the event of partial loss of intact buoyancy. <i>Vessel construction</i> General knowledge of the principal structural members of an inland vessel and the proper names for the various parts	Examination oral/written	Actions to ensure and maintain the stability and watertight integrity of the vessel are in accordance with accepted practice
Monitor and control compliance with legislative requirements and measures	1. Knowledge of the provisions of the Inland Vessel Act and rules framed thereunder.	Examination oral/written.	Procedures for monitoring operations and maintenance comply with local / state legislative

to ensure safety of life and the protection of the marine environment	2. Knowledge of Port rules, and IWAI rules.		requirements. Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment.
---	---	--	--

Table II/2

Specification of minimum standards of competence for Master Class 2

Function: Navigation

Function: Cargo Handling and Stowage

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Plan and conduct a passage and determine vessel's position	<p>Navigation- Ability to determine the vessel's position by the use of:</p> <ol style="list-style-type: none"> 1. landmarks 2. aids to navigation, including lighthouses, beacons and buoys 3. depth contour 4. dead reckoning, taking into account the effects of winds, bore tides, currents and estimated speed. <p>Knowledge of steering system on Inland vessels.</p> <p>Knowledge of and ability to use Inland Water and river navigation chart,</p>	<p>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 laboratory equipment training using: charts of Inland waters, navigational publications, radio navigational warnings, azimuth mirror, GPS, RADAR and Echo sounder. 	<p>Information obtained from navigational charts and publications is interpreted correctly and applied.</p> <p>The position is determined within the limits of acceptable instrument/system errors.</p> <p>The reliability of the information obtained from the primary method of position fixing is checked at appropriate intervals.</p> <p>Charts selected are suitable for the area of navigation and charts are corrected in accordance</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Plan and ensure safe loading, stowage, securing, care during the voyage and the unloading of cargoes	river atlas, river pilots, tide tables, GPS, RADAR, and Echo sounder. <i>Cargo handling, stowage and securing</i>	Examination and assessment of evidence obtained from	with the latest information available.
Plan and conduct a passage and determine vessel's position	1. Knowledge of the effect of cargo on seaworthiness and stability of the vessel. 2. Ability to determine errors of the compass and securing of cargo.	1. approved in-service experience. 2. approved training ship experience	Interpretation and analysis of information obtained from radar is as per navigational practice and takes account of the limits and accuracy levels. Errors in magnetic & Gyro compasses are determined and applied correctly to courses and bearings.
Inspect and report defects and damages to cargo spaces, hatch covers and ballast tanks.	Knowledge of detecting the damages and defects due to <i>Meteorology -</i> 1. Ability to interpret and apply the meteorological information available. 2. Knowledge of seasons and general weather conditions throughout the year in the area of operation.	Examination and assessment of evidence obtained from 1. approved in-service experience 2. approved training ship experience	Inspections are carried out, defects and damages are detected and reported. Meteorological information is evaluated and applied to maintain the safe passage of the vessel
Plan and ensure cargo hold ventilation.	1. Knowledge of taking and handing over watch.	Examination and assessment of evidence obtained from approved in-service	Cargo hold ventilation is carried out in accordance with the requirements and procedures.
	2. Knowledge of content, application and intent of the Rules of the Road as per IWAI Act. 3. Knowledge of the principles to be observed in keeping a navigational watch. 4. Knowledge of navigation near barrages, dams, canals and rivers. 5. Knowledge of tide, range and timings. 6. Knowledge of buoyage system.	experience	A proper look-out is maintained at all times. Lights, shapes and sound signals contained in the Regulations and are correctly recognized. The frequency and extent of monitoring of traffic and the vessel's position is as per accepted principles and procedures. Action to avoid close encounters and collision with other vessels is in accordance with the Regulations.

	<p>7. Knowledge of writing of log books and weather reports.</p> <p>8. Knowledge of rivers, canals and waterways</p>		<p>A proper record is maintained of movements and activities relating to the navigation of the vessel.</p>
Respond to emergencies	<p>Knowledge of Emergency procedures:</p> <ol style="list-style-type: none"> 1. Actions for the protection and safety of passengers in emergency situations. 2. Initial assessment of damage and damage control. 3. Action to be taken following a collision / grounding. 4. Management of inland vessel under tow. 5. Action to be taken on engine / steering failure. 6. Rescuing persons from the water. 7. Appreciation of the action to be taken when emergencies arise in port. 	<p>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. practical instruction. 	<p>The emergency is promptly identified.</p> <p>Initial actions are taken appropriate to the nature and urgency of the situation.</p> <p>Awareness of the company instructions on emergency handling.</p>
Respond to a storm and distress signal	<p>Knowledge of Storm, Distress and Emergency signal.</p>	<p>Examination and assessment of evidence obtained from practical instruction</p>	<p>The storm, distress or emergency signal immediately recognized and acted upon in accordance with instructions and standing orders of the company and or competent authority.</p>
Manoeuvre the vessel	<p><i>Knowledge of Vessel manoeuvring and handling in rivers and channels-</i></p> <ol style="list-style-type: none"> 1. Effect of draught, trim, speed and, under keel 	<p>Examination and assessment of evidence obtained from approved in-service experience</p>	<p>Vessel propulsion and steering systems are operated safely.</p> <p>Adjustments made to the vessel course and speed to maintain safety of</p>

	<p>clearance on turning circles and stopping distances.</p> <p>2. Turning a vessel short round.</p> <p>3. Proper procedures to bring the vessel to an anchor and get underway</p> <p>4. Proper procedure to bring her to jetty, pier or wharf and casting off.</p>		navigation.
--	--	--	-------------

Function: communications

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Communication with shore radio stations and other vessels	<ol style="list-style-type: none"> 1. Basic knowledge of local signals. 2. Knowledge of VHF radio, EPIRB and SART operation procedures appropriate to the vessels concerned and the operations on which they are engaged. 	Examination and assessment of evidence obtained from approved training and in-service experience.	Operational and emergency communications are carried out in accordance with operational instructions and emergency.

Function: Controlling the operation of the vessel and care for persons on board

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ensure compliance with pollution prevention requirements	<p><i>Prevention of pollution of the marine environment and anti-pollution procedures.</i></p> <ol style="list-style-type: none"> 1. Knowledge of the precautions to be taken to prevent pollution of the marine environment 2. Knowledge of anti- 	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring onboard operations and ensuring compliance with anti-pollution requirements are fully observed.

	<p>pollution procedures.</p> <p>3. Knowledge of anti-pollution procedures and use of associated equipment.</p>		
Maintain seaworthiness of the vessel	<p><i>Vessel stability</i></p> <ol style="list-style-type: none"> Working knowledge of factors that affect stability and trim. Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy. Understanding of the fundamentals of watertight integrity. <p><i>Vessel construction</i></p> <p>General knowledge of the principal structural members of a vessel and the proper names for the various parts</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> approved in-service experience approved laboratory equipment training 	<p>Actions to ensure and maintain the stability and watertight integrity of the vessel are in accordance with accepted practice.</p>
Monitor and control compliance with legislative requirements and measures to ensure safety of life and the protection of the marine environment	<p><i>Knowledge of the Regulations and other relevant legislation.</i></p> <ol style="list-style-type: none"> Knowledge of the provisions of the Inland Vessel Act and rules framed thereunder. Knowledge of Port rules, and IWAI Acts/Rules. Knowledge of relevant DG Shipping notices, IWAI Circulars and Notices. Knowledge of Certificates and other documents required to be carried by the vessel. 	<p>Examination and assessment of evidence obtained from approved in-service experience</p>	<p>Procedures for monitoring operations and maintenance comply with legislative requirements.</p> <p>Potential non-compliance is promptly and fully identified.</p> <p>Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment.</p>

Use of leadership and managerial skills	<i>Knowledge of onboard personnel management and training</i> 1. Ability to apply task and workload management. 2. Knowledge and ability to apply effective resource management.	Examination and assessment of evidence obtained from approved in-service training and experience	The crew are allocated duties and informed of expected standards of work. Training objectives and activities are based on an assessment of current competence and capabilities and operational requirements.
---	--	--	---

Deck Competency Tables

Table- II/3

**Specification of minimum standards of competence for Master Class I
Function: Navigation**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Plan and conduct a passage and determine vessel's position	1. Navigation Ability to determine the vessel's position by the use of all navigation aids and equipment	Examination and assessment of evidence obtained from one or more of the following:	Information obtained from navigational charts and publications is relevant, interpreted correctly and

	<p>such as GPS, Echo Sounder, and RADAR commonly fitted on board the vessels.</p> <p>2. Knowledge of steering system on Inland vessels.</p> <p>3. Ability to use Inland Water navigation charts and publications, such as river atlas, river pilots, river notices, notices to mariners, radio navigational warnings.</p>	<ol style="list-style-type: none"> 1. approved in-service experience 2. approved laboratory equipment training using: chart catalogues, charts, navigational publications[Hydrographic charts of Inland and coastal water], radio navigational warnings, azimuth mirror, electronic navigation equipment, echo sounding equipment, 	<p>properly applied.</p> <p>The position is determined within the limits of acceptable instrument/system errors.</p> <p>Calculations and measurements of navigational information are accurate. Charts are corrected in accordance with the latest information available.</p> <p>Performance checks and tests of navigation systems comply with good navigational practice.</p> <p>Interpretation and analysis of information obtained from radar is in accordance with accepted navigational practice and takes account of the limits and accuracy levels of radar.</p>
<p>Plan and conduct a passage and determine vessel's position</p>	<p><i>Compasses</i> Knowledge of the errors of magnetic and gyro compasses. Ability to determine errors of the compass using terrestrial means, and to allow for such errors.</p> <p><i>Meteorology</i> Ability to interpret and apply the meteorological information available. Knowledge of seasons and general</p>	<p>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 laboratory equipment 	<p>Errors in Magnetic and Gyro compasses are determined and applied correctly to courses and bearings.</p> <p>Meteorological information is evaluated and applied to maintain the safe passage of the vessel</p>

	weather throughout the year in the area of operation.		
Maintain a safe navigational watch	<p><i>Watchkeeping</i></p> <ol style="list-style-type: none"> 1. Thorough knowledge of content, application and intent of the Rules of the Road. 2. Knowledge of the principles to be observed in keeping a navigational watch. 3. Navigation near barrages, dams, canals and rivers. 4. Knowledge of tide, range and timings. 5. Knowledge of buoyage system. 6. Knowledge of tidal semaphores. 7. Knowledge of writing of log books and weather reports. 8. Knowledge of rivers, canals and waterways 	Examination and assessment of evidence obtained from approved in-service experience	<p>A proper look-out is maintained at all times and in conformity with accepted principles and procedures.</p> <p>Lights, shapes and sound signals conform with the requirements contained in the Regulations and are correctly recognized.</p> <p>The frequency and extent of monitoring of traffic, the vessel and the environment conform with accepted principles and procedures.</p> <p>Action to avoid close encounters and collision with other vessels is in accordance with the Regulations.</p> <p>Decisions to adjust course and/or speed are both timely and in accordance with accepted navigation procedures.</p> <p>A proper record is maintained of movements and activities relating to the navigation of the vessel.</p>
Respond to emergencies	<p>Knowledge of emergency procedures, including:</p> <ol style="list-style-type: none"> 1. Actions for the protection and safety of passengers in 	Examination and assessment of evidence obtained from one or more of the following: <ol style="list-style-type: none"> 1. approved in-service 	Initial actions and, if appropriate manoeuvring are in accordance with contingency plans and are appropriate to the urgency of the situation and the

	<p>emergency situations.</p> <ol style="list-style-type: none"> 2. Initial assessment of damage and damage control. 3. Action to be taken following a collision / grounding. 4. Management of inland vessel under tow. 5. Action to be taken on engine / steering failure. 6. Rescuing persons from the water. 7. Appreciation of the action to be taken when emergencies arise in port. 	<p>experience</p> <ol style="list-style-type: none"> 2. practical instruction 	<p>nature of the emergency.</p> <p>Awareness of the company instructions on emergency handling.</p>
Manoeuvre the vessel	<p><i>Vessel manoeuvring and handling</i></p> <p>Knowledge of</p> <ol style="list-style-type: none"> 1. Effect of dwt, draught, trim, speed and, under keel clearance on turning circles and stopping distances. 2. Turning a vessel short round. 3. Proper procedures to bring the vessel to an anchor and get underway. 4. Proper procedure to bring her to jetty, pier or wharf and casting off. 5. Knowledge of Squat and shallow water effects. 	<p>Examination and assessment of evidence obtained from approved in-service experience/ approved training</p>	<p>Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvre</p> <p>Adjustments made to the vessel course and speed to maintain safety of navigation.</p>

Function: Cargo Handling and stowage

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Plan and ensure safe loading, stowage, securing, care during the voyage and the unloading of cargoes	<p><i>Cargo handling, stowage and securing</i></p> <ol style="list-style-type: none"> 1. Knowledge of the effect of cargo on seaworthiness and stability of the vessel. 2. Knowledge of safe handling, stowage and securing of cargo. 3. Knowledge of operational and design limitations of inland vessels. 	Examination and assessment of evidence obtained from approved in-service experience / approved training	Cargo operations are carried out in accordance with the cargo plan or other documents and established safety onboard stowage limitations.
Inspect and report defects and damages to cargo spaces, hatch covers and ballast tanks.	Knowledge of detecting the damages and defects due to loading and unloading operations Corrosion severe weather conditions	Examination and assessment of evidence obtained from approved in-service experience / approved training	Inspections are carried out, defects and damages are detected and reported.

Function: Communications

Function: Controlling the operation of the vessel and care for persons on board

Ensure compliance with pollution prevention requirements	<p><i>Prevention of pollution of the marine environment and anti-pollution procedures.</i></p> <ol style="list-style-type: none"> 1. Knowledge of the precautions to be taken to prevent pollution of the marine environment. 2. Knowledge of anti-pollution procedures and use of all associated equipment. 	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring onboard operations and ensuring compliance with anti-pollution requirements are fully observed.
Maintain seaworthiness of the vessel	<p><i>Vessel stability</i></p> <p>Working knowledge of factors that affect stability and trim.</p> <p>Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.</p> <p>Understanding of the fundamentals of watertight integrity.</p>	Examination and assessment of evidence obtained from one or more of the following: 1 approved in-service experience 2 approved laboratory equipment training	Actions to ensure and maintain the stability and watertight integrity of the vessel are in accordance with accepted practice

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Communication with shore radio stations and other vessels using VHF radio communications appropriate to the vessels concerned and the operations on which they are engaged	<p>Basic knowledge of the International Code of Signals and local signals.</p> <p>Knowledge of VHF radio, EPIRB and SART operations procedures appropriate to the vessels concerned and the operations on which they are engaged</p>	Examination and assessment of evidence obtained from approved training and in-service experience	Operational and emergency communications are carried out in accordance with operational instructions and emergency or contingency plans

	<i>Vessel construction</i> General knowledge of the principal structural members of a vessel and the proper names for the various parts		
Monitor and control compliance with legislative requirements and measures to ensure safety of life and the protection of the marine environment	<i>Knowledge of the Regulations and other relevant legislation.</i> 1. Knowledge of the provisions of the Inland Vessel Act and rules framed thereunder. 2. Knowledge of Port rules, and IWAI rules. 3. Knowledge of relevant DG notices. 4. Knowledge of national legislation related to personnel matters. 5. Knowledge of Certificates and other documents required to be carried by the vessel.	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring operations and maintenance comply with legislative requirements. Potential non-compliance is promptly and fully identified. Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment.
Use of leadership and managerial skills	<i>Knowledge of onboard personnel management and training</i> 1. Ability to apply task and workload management. 2. Knowledge and ability to apply effective resource management.	Examination and assessment of evidence obtained from approved in-service training and experience	The crew are allocated duties and informed of expected standards of work. Training objectives and activities are based on an assessment of current competence and capabilities and operational requirements.

Deck Competency Tables

Table – II/4

**Specification of minimum standard of competence for Deck Watch Rating
Function: Navigation**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and	Methods for demonstrating	Criteria for evaluating competence

	proficiency	competence	
Steer the ship and comply with helm orders	Knowledge of steering a steady course. Understanding of helm orders.	Assessment of evidence obtained from: .1 practical test, or .2 approved in-service experience	A steady course is steered within acceptable limits having regard to the area of navigation and prevailing sea state. Alterations of course are smooth and controlled. Communications are clear and concise at all times and orders are acknowledged in a seamanlike manner.
Keep a proper look-out by sight and hearing	Responsibilities of a look-out, including reporting the approximate bearing of a sound signal, light or other object in degrees or points.	Assessment of evidence obtained from: 1 practical test, or 2 approved in-service experience	Sound signals, lights and other objects are promptly detected and their appropriate bearing in degrees or points is reported to the officer of the watch.
Operate emergency equipment and apply emergency procedures	Knowledge of emergency duties and alarm signals. Basic environmental protection procedure	Assessment of evidence obtained from demonstration and approved in-service experience	Initial action on becoming aware of an emergency or abnormal situation is in conformity with established practices and procedures.

Engine Competency Tables

Table -III/1

Specification of minimum standard of competence for Engineer class 3

Function: Marine Engineering

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch including: .1 duties associated with taking over and accepting a watch .2 routine duties undertaken during a watch .3 maintenance of the	Examination or assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved laboratory equipment training	The conduct, handover and relief of the watch conforms with the accepted principles and procedures. The frequency and extent of monitoring of

	<p>machinery space log book and the significance of the readings taken.</p> <p>.4 duties associated with handing over a watch.</p> <p>Safety and emergency procedures:</p> <p>.1 changeover of remote/automatic to local control of all systems.</p> <p>.2 Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil and chemical systems</p>		<p>engineering equipment and systems conforms to manufacturers' recommendations and accepted principles and procedures, including principles to be observed in keeping an engineering watch.</p> <p>A proper record is maintained of the movements and activities relating to the vessel's engineering systems</p>
<p>Operate main and auxiliary machinery and associated control systems</p>	<p>Knowledge of :</p> <p>.1 working of various types of Internal Combustion Engine. (applicable limited power)</p> <p>.2 Use and management of different valves, pipes and connections.</p> <p>.3 Various methods of supplying air and fuel to the cylinder.</p> <p>.4 Nature and properties of fuel oil and chemical.</p> <p>.5 preparation of main and auxiliary machinery for operation .</p> <p>.6 causes which make the engine difficult to start and remedies</p> <p>.7 operation of Steering gear</p> <p>.8 operation of deck machinery</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment.</p> <p>The output of plant and engineering systems consistently meets requirements including bridge orders relating to changes in speed and direction.</p> <p>The causes of machinery</p>

			malfunctions are promptly identified and actions are designed to ensure the overall safety of the vessel and the plant having regard to the prevailing circumstances and conditions
Operate pumping systems and associated control systems	<p>Pumping systems:</p> <p>.1 routine pumping operations</p> <p>.2 operation of bilge and ballast pumping systems.</p> <p>.3 Dangers resulting due to leakages from the fuel oil.</p> <p>.4 Safe bunkering, ballasting and deballasting.</p> <p>.5 routine maintenance of machinery including pumps and piping systems</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p> <p>.3 approved simulator training, where appropriate</p>	<p>Fuel and ballast operations meet operational requirements and are carried out so as to prevent pollution of the marine environment.</p> <p>Precautions are taken to safe guard against fire and explosion due to fuel oil and chemical leakages.</p>

Function: Electrical Engineering

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate generators and control systems	<p>Generating plant: Appropriate basic electrical knowledge and skills-preparing, starting, coupling and changing over of generators. Location of common faults and</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations</p>

	action to prevent damage.		
Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations	Safety requirements for working on onboard electrical systems. Construction and operational characteristics of onboard AC and DC electrical systems and equipment. Operation of electrical test and measuring equipment.	Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training .2 approved practical experience and tests	Implementation of safety procedures is satisfactory. Selection and use of test equipment is appropriate and interpretation of results is accurate. Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice.

Function: Maintenance and repair

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
Use appropriate tools for construction and repair operations typically performed on vessels	.1 Characteristics and limitations of materials used in construction and repair of vessels and equipment .2 Application of safe working practices in the workshop environment	Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training .2 approved practical experience and tests	Identification of important parameters for construction of typical vessel related components is appropriate. Use of equipment and machine tools is appropriate and safe
Use hand tools and measuring equipment for dismantling, maintenance, repair and reassembly of onboard plant and equipment	Design characteristics and selection of materials in construction of equipment. Interpretation of machinery drawings and handbooks. Operational characteristics of	Assessment of evidence obtained from one or more of the following: .1 approved workshop skill training .2 approved practical experience and tests	Safety procedures followed are appropriate. Selection of tools and spare gear is appropriate. Dismantling, inspecting, repairing and reassembling equipment is in accordance with

	equipment and systems		manuals and good practice
Maintain marine engineering systems including control systems	<p><i>Marine engineering systems.</i> Appropriate basic mechanical knowledge and skills. <i>Safety and emergency procedures:</i> Safe isolation of electrical and other types of plant and equipment required before personnel are permitted to work on such plant or equipment .Undertake overhauling of engine. Understands wear and tear of machinery.</p>	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved laboratory equipment training	Isolation, dismantling and reassembly of plant and equipment is in accordance with accepted practices and procedures. Action taken leads to the restoration of plant by the method most suitable and appropriate to the prevailing circumstances and conditions

Function: Controlling the operation of the vessel and care for persons on board

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ensure compliance with pollution prevention requirements	<p><i>Prevention of pollution of the marine environment</i> Knowledge of the precautions to be taken to prevent pollution of the marine environment Anti-pollution procedures and all associated equipment</p>	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring onboard operations and ensuring compliance with local requirements are fully observed
Maintain seaworthiness of the vessel	<p><i>Vessel stability</i> Working knowledge of factors affecting stability and trim</p>	Examination and assessment of evidence obtained from one or more of	Actions to ensure and maintain the watertight integrity of the vessel are in

	<p>Understanding of the fundamentals of watertight integrity</p> <p>Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy</p> <p><i>Vessel construction</i></p> <p>General knowledge of the principal structural members of a vessel and the proper names for the various parts</p>	<p>the following: .1 approved in-service experience .2 approved laboratory equipment training</p>	<p>accordance with accepted practice</p>
<p>Monitor and control compliance with legislative requirements and measures to ensure safety of life and the protection of the marine environment</p>	<p>Knowledge of the relevant regulations.</p>	<p>Examination and assessment of evidence obtained from approved in-service experience</p>	<p>Procedures for monitoring operations and maintenance comply with legislative requirements</p> <p>Potential non-compliance is promptly and fully identified</p> <p>Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment</p>

Engine Competency Tables

Table-III/2

Specification of minimum standard of competence for Engineer Class 2

Function: Marine Engineering

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch including: .1 duties associated with taking/handing over a watch .2 routine duties undertaken during a watch .3 maintenance of the machinery space log book and the significance of the readings taken .4 Safety and emergency procedures; changeover of remote/automatic to local control of all systems. .5 Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil and chemical systems.	Examination or assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved laboratory equipment training	The conduct, handover and relief of the watch conforms with accepted principles and procedures. The frequency and extent of monitoring of engineering equipment and systems conforms to manufacturers' recommendations and accepted principles and procedures, including principles to be observed in keeping an engineering watch. A proper record is maintained of the movements and activities relating to the vessel's engineering systems.
Operate main and auxiliary machinery and associated control systems	Knowledge of : .1 working of various types of Internal Combustion Engine. .2 Use and management of different valves, pipes and connections.	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid

	<p>.3 Various methods of supplying air and fuel to the cylinder.</p> <p>.4 preparation of main and auxiliary machinery for operation.</p> <p>.5 causes which make the engine difficult to start and remedies</p> <p>.6 Nature and properties of fuel oil and chemical.</p> <p>.7 mechanism of the starting and reversing arrangements</p> <p>.8 Trouble shooting of engines</p> <p>.9 Steering gear</p> <p>.10 deck machinery.</p> <p>.11 Shafting installations including propellers</p>	laboratory equipment training	<p>pollution of the marine environment.</p> <p>The output of plant and engineering systems consistently meets requirements including bridge orders relating to changes in speed and direction.</p> <p>The causes of machinery malfunctions are promptly identified and actions are designed to ensure the overall safety of the vessel and the plant having regard to the prevailing circumstances and conditions</p>
Operate pumping systems and associated control systems	<p>Pumping systems:</p> <p>.1 routine pumping operations</p> <p>.2 operation of bilge and ballast pumping systems</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment</p>
Manage fuel and ballast operations	<p>Knowledge of</p> <p>.1 Operation and maintenance of machinery including pumps and piping systems</p> <p>.2 Dangers resulting due to leakages from the fuel oil tanks.</p> <p>.3 Safe bunkering , ballasting and / deballasting.</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training, where appropriate</p>	<p>Fuel and ballast operations meet operational requirements and are carried out so as to prevent pollution of the marine environment.</p> <p>Precautions are taken to safe guard against fire and</p>

			explosion due to fuel oil and chemical leakages.
--	--	--	--

Function: Electrical Engineering

Function: Maintenance and repair

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use appropriate tools for construction and repair operations typically performed on vessels	.1 Characteristics and limitations of materials used in construction and repair of vessels and equipment .2 Characteristics and limitations of processes used for construction and repair .3 Properties and parameters considered in the construction and repair of systems and	Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training .2 approved practical experience and tests	Identification of important parameters for construction of typical vessel related components is appropriate. Selection of material is appropriate. Use of equipment and machine tools is appropriate and safe

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations	<p>Safety requirements for working on onboard electrical systems.</p> <p>Construction and operational characteristics of onboard AC and DC electrical systems and equipment.</p> <p>Construction and operation of electrical test and measuring equipment</p> <p>Detection of electric malfunction, location of faults and measures to prevent damages</p> <p>Interpretation of electrical and simple electronic diagrams</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved workshop skills training</p> <p>.2 approved practical experience and tests</p>	<p>Implementation of safety procedures is satisfactory.</p> <p>Selection and use of test equipment is appropriate and interpretation of results is accurate.</p> <p>Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice.</p> <p>Commissioning and performance testing of equipment and systems brought back into service after repair is in accordance with manuals and good practice</p>
Operate generators and control systems	<p><i>Generating plant:</i> Appropriate basic electrical knowledge and skills Preparing, starting, coupling and changing over generators. Location of common faults and action to prevent damage.</p> <p><i>Control systems:</i> Location of common faults and action to prevent damage</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations</p>

	components		
	.4 Application of safe working practices in the workshop environment		
Use hand	Design	Assessment of	Safety procedures

tools and measuring equipment for dismantling, maintenance, repair and reassembly of onboard plant and equipment	<p>characteristics and selection of materials in construction of equipment.</p> <p>Interpretation of machinery drawings.</p> <p>Operational characteristics of equipment and systems</p>	<p>evidence obtained from one or more of the following:</p> <p>.1 approved workshop skill training</p> <p>.2 approved practical experience and tests</p>	<p>followed are appropriate.</p> <p>Selection of tools and spare gear is appropriate.</p> <p>Dismantling, inspecting, repairing and reassembling equipment is in accordance with manuals and good practice.</p> <p>Re-commissioning and performance testing is in accordance with manuals and good practice</p>
Maintain marine engineering systems including control systems	<p><i>Marine engineering systems</i> –</p> <p>Appropriate basic mechanical knowledge and skills.</p> <p><i>Safety and emergency procedures:-</i></p> <p>Safe isolation of electrical and other types of plant and equipment required before personnel are permitted to work on such plant or equipment.</p> <p>Undertake overhauling of engine.</p> <p>Undertake valve and injector setting of engine.</p> <p>Able to replace liner and head of engines.</p> <p>Understands wear and tear of machinery.</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>Isolation, dismantling and reassembly of plant and equipment is in accordance with accepted practices and procedures.</p> <p>Action taken leads to the restoration of plant by the method most suitable and appropriate to the prevailing circumstances and conditions</p>

Function: Controlling the operation of the vessel and care for persons on board

Column 1	Column 2	Column 3	Column 4
	Knowledge,	Methods for	Criteria for

Competence	understanding and proficiency	demonstrating competence	evaluating competence
Ensure compliance with pollution prevention requirements	<i>Prevention of pollution of the marine environment</i> – Knowledge of the precautions to be taken to prevent pollution of the marine environment. Anti-pollution procedures and all associated equipment	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring onboard operations and ensuring compliance with local requirements are fully observed
Maintain seaworthiness of the vessel	<i>Vessel stability</i> – Working knowledge of factors affecting stability and trim. Understanding of the fundamentals of watertight integrity. Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy. <i>Vessel construction</i> General knowledge of the principal structural members of a vessel and the proper names for the various parts	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved laboratory equipment training	Actions to ensure and maintain the watertight integrity of the vessel are in accordance with accepted practice
Monitor and control compliance with legislative requirements and measures to ensure safety of life and the protection of the marine environment	Knowledge of the relevant legislation	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring operations and maintenance comply with legislative requirements. Potential non-compliance is promptly and fully identified. Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment

Engine Competency Tables

Table -III/3

**Specification of minimum standard of competence for Engineer Class 1 of
Inland Motor Vessel**

Function: Marine Engineering

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain a safe engineering watch	<p>Thorough knowledge of principles to be observed in keeping an engineering watch including:</p> <p>.1 duties associated with taking over and accepting a watch .2 routine duties undertaken during a watch .3 maintenance of the machinery space log book and the significance of the readings taken .4 duties associated with handing over a watch Safety and emergency procedures; changeover of remote/automatic to local control of all systems Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil and chemical systems</p>	<p>Examination or assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience .2 approved laboratory equipment training</p>	<p>The conduct, handover and relief of the watch conforms with accepted principles and procedures. The frequency and extent of monitoring of engineering equipment and systems conforms to manufacturers' recommendations and accepted principles and procedures, including principles to be observed in keeping an engineering watch. A proper record is maintained of the movements and activities relating to the vessel's engineering systems</p>
Operate main and auxiliary machinery and associated	<p>Knowledge of :</p> <p>.1 working of various types of Internal Combustion Engine. .2 Use and management of</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to</p>

control systems	<p>different valves, forks, pipes and connections. .3 Various methods of supplying air and fuel to the cylinder. Construction of the apparatus for carbureting, atomizing or gasifying the fuel, and means for cooling the cylinders, pistons, etc. .4 preparation of main and auxiliary machinery for operation . .5 causes which make the engine difficult to start and remedies .6 mechanisms of the starting and reversing arrangements. .7 Nature and properties of fuel oil and chemical. .8 trouble shooting of engines. .9 take off and calculate indicator diagrams and understand action of gas in the cylinder. .10 testing the fairness of shafting</p>	<p>service experience .2 approved laboratory equipment training</p>	<p>ensure safety of operations and avoid pollution of the marine environment. The output of plant and engineering systems consistently meets requirements including bridge orders relating to changes in speed and direction. The causes of machinery malfunctions are promptly identified and actions are designed to ensure the overall safety of the vessel and the plant having regard to the prevailing circumstances and conditions</p>
Operate pumping systems and associated control systems	<p>Pumping systems: .1 routine pumping operations .2 operation of bilge and ballast pumping systems</p>	<p>Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment.</p>
Manage fuel and ballast operations	<p>Knowledge of .1 Operation and maintenance of machinery including pumps and piping systems .2 consumption of oil and chemicals, capacity of tanks. .3 Dangers resulting due to leakages from</p>	<p>Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved simulator training, where appropriate</p>	<p>Fuel and ballast operations meet operational requirements and are carried out so as to prevent pollution of the marine environment. Precautions are taken to safe guard against fire</p>

	<p>the fuel oil and chemical tanks.</p> <p>.4 Action of wire gauge diaphragms when placed in pipes and connections to oil and chemical tanks.</p> <p>.5 Safe bunkering and ballasting operation.</p>		<p>and explosion due to fuel oil and chemical leakages.</p>
--	--	--	---

Function: Electrical Engineering

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations	<p>Safety requirements for working on onboard electrical systems.</p> <p>Construction and operational characteristics of onboard AC and DC electrical systems and equipment.</p> <p>Construction and operation of electrical test and measuring equipment</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved workshop skills training</p> <p>.2 approved practical experience and tests</p>	<p>Implementation of safety procedures is satisfactory.</p> <p>Selection and use of test equipment is appropriate and interpretation of results is accurate.</p> <p>Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice.</p> <p>Commissioning and performance testing of equipment and systems brought back into service after repair is in accordance with manuals and good practice</p>
Operate generators and control systems	<p><i>Generating plant.</i></p> <p>Appropriate basic electrical knowledge and skills. Preparing, starting, coupling and changing over of generators. Location of</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience.</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of</p>

<p>common faults and action to prevent damage. <i>Control systems:</i> Location of common faults and action to prevent damage Construction of electric light engines, electric motor, etc. Principal construction and arrangement of primary and secondary batteries and induction coil and chemicals.</p>	<p>.2 approved laboratory equipment training</p>	<p>operations</p>
--	--	-------------------

Function: Maintenance and repair

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Use appropriate tools for repair operations typically performed on vessels</p>	<p>.1 Characteristics and limitations of materials used in construction and repair of vessels and equipment .2 Characteristics and limitations of processes used for construction and repair .3 Properties and parameters considered in the and repair of systems and components .4 Application of safe working practices in the workshop environment</p>	<p>Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training .2 approved practical experience and tests</p>	<p>Identification of important parameters for typical vessel related components is appropriate. Selection of material is appropriate. Use of equipment and machine tools is appropriate and safe</p>
<p>Use hand tools and measuring equipment for dismantling, maintenance</p>	<p>Design characteristics and selection of materials in construction of equipment. Interpretation of machinery drawings and</p>	<p>Assessment of evidence obtained from one or more of the following: .1 approved workshop skill training .2 approved</p>	<p>Safety procedures followed are appropriate. Selection of tools and spare gear is appropriate.</p>

, repair and reassembly of onboard plant and equipment	<p>handbooks.</p> <p>Knowledge of the rudiment of projections and be able to make a dimensioned working drawing of simple parts.</p> <p>Operational characteristics of equipment and systems</p> <p>Methods for carrying out safe emergency/temporary repairs.</p> <p>Use of various types of sealants and packing.</p>	practical experience and tests	<p>Dismantling, inspecting, repairing and reassembling equipment is in accordance with manuals and good practice.</p> <p>Re-commissioning and performance testing is in accordance with manuals and good practice</p>
Maintain marine engineering systems including control systems	<p><i>Knowledge of :</i></p> <p>.1 <i>Safety and emergency procedures.</i></p> <p>.2 Safe isolation of electrical and other types of plant.</p> <p>.3 overhauling of engine.</p> <p>.4 valve and injector setting of engine.</p> <p>.5 replacing liner and head of engines.</p> <p>.6 repair of spring or level loaded safety and relief valves,</p> <p>.7 Understands wear and tear of machinery.</p> <p>.8 consumption of spares and stores.</p> <p>.9 Interpretation of piping, hydraulic and pneumatic diagrams</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>Isolation, dismantling and reassembly of plant and equipment is in accordance with accepted practices and procedures.</p> <p>Action taken leads to the restoration of plant by the method most suitable and appropriate to the prevailing circumstances and conditions.</p>

Function: Controlling the operation of the vessel and care for persons on board

Engine Competency Tables

Table -III/4

**Specification of minimum standard of competence for Engine Watch Rating
Function: Marine Engineering**

Column 1	Column 2	Column 3	Column 4
-----------------	-----------------	-----------------	-----------------

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Carry out a watch	Terms used in machinery spaces and	Assessment of evidence obtained	Communications are clear and

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
Ensure compliance with pollution prevention requirements	<i>Prevention of pollution of the marine environment</i> - Knowledge of the precautions to be taken to prevent pollution of the marine environment. Anti-pollution procedures and operation of all associated equipments	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring onboard operations and ensuring compliance with local requirements are fully observed.
Maintain seaworthiness of the vessel	<i>Vessel stability</i> – Working knowledge of factors affecting stability and trim. Understanding of the fundamentals of watertight integrity’ Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy. <i>Vessel construction</i> – General knowledge of the principal structural members of a vessel and the proper names for the various parts. Construction of the internal combustion engines. Construction of air compressors, gas producers, steering engines, electric light engines, dynamos, electric motor, refrigerating, hydraulic and other auxiliary machinery on board. Construction of auxiliary	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved laboratory equipment training	Actions to ensure and maintain the watertight integrity of the vessel are in accordance with accepted practice .

	steam boiler and chemicals.		
Monitor and control compliance with legislative requirements and measures to ensure safety of life and the protection of the marine environment	Knowledge of the Regulations and other relevant legislation	Examination and assessment of evidence obtained from approved in-service experience	Procedures for monitoring operations and maintenance comply with legislative requirements. Potential non-compliance is promptly and fully identified. Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment
routine appropriate to the duties of a rating forming part of an engine-room watch Understand orders and be understood in matters relevant to watchkeeping duties	names of machinery and equipment Engine-room watchkeeping procedures Safe working practices as related to engine-room operations Basic environmental protection procedures Use of appropriate internal communication system Engine-room alarm systems and ability to distinguish between the various alarms, with special reference to fire-extinguishing gas alarms	from one or more of the following: .1 approved in-service experience; Or .2 practical test	concise and advice or clarification is sought from the officer of the watch where watch information or instructions are not clearly understood Maintenance, hand-over and relief of the watch is in conformity with accepted principles and procedures
Operate emergency equipment and apply emergency procedures	Knowledge of emergency duties Escape routes from machinery spaces Familiarity with the location and use of fire-fighting equipment in the machinery spaces	Assessment of evidence obtained from demonstration and approved in-service experience	Initial action on becoming aware of an emergency or abnormal situation conforms with established procedures Communications are clear and

			concise at all times and orders are acknowledged in a seamanlike manner
--	--	--	---

