



Council of the European Union
General Secretariat

Brussels, 05 November 2025

WK 14962/2025 INIT

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WORKING DOCUMENT

From: General Secretariat of the Council
To: Working Party on Shipping

N° prev. doc.:

Subject: Preparation of IMO/HTW 12 (London, 23-27 February 2026) – Draft Union submission to the 12th session of the International Maritime Organization's Sub-Committee on Human Element, Training and Watchkeeping proposing amendments to the 1978 STCW Convention and Code in relation to chapter III on engine department
- Presidency Compromise

In view of the Shipping Working Party meeting on 10 November 2025, delegations will find attached a Presidency compromise proposal concerning the above-mentioned submission.

Changes compared to the Commission proposal (document WK 14273/25) are indicated in **bold underline** (new text) and ~~strikethrough~~ (deleted text).

General scrutiny reservation: all delegations.

Deadline for transmission to the IMO: 21 November 2025.

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COMPREHENSIVE REVIEW OF THE 1978 STCW CONVENTION AND CODE

Proposed draft amendments to the 1978 STCW Convention and Code to address gap(s) No. 109, 174, 176 and 181

Submitted by Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the European Commission, acting jointly in the interest of the European Union

SUMMARY

Executive summary: This document provides draft amendments to the 1978 STCW Convention and Code, in order to address gap(s) No. 109, 174, 176 and 181.

Strategic direction, if applicable: 6

Output: 6.17

Action to be taken: 5

Related documents: HTW 11/11 and HTW 12/6

Background

1 The Sub-Committee, at its eleventh session, agreed to the list of gaps identified in the STCW Convention and Code, as set out in annex 1 to document HTW 11/WP.4. The Sub-Committee also agreed to the commencement of phase 2 of the comprehensive review (HTW 11/11, paragraphs 6.34 and 6.35).

2 This document provides draft amendments to the 1978 STCW Convention and Code, in order to address gap(s) No. 109, 174, 176 and 181 in relation to the matter on chapter III.

Information to support the proposed amendments

3 Taking into account the information for the submission of proposals for phase 2 of the comprehensive review of the STCW Convention and Code, as set out in document HTW 12/6 (Secretariat), information to support the proposed amendments, is set out below:

Information to support the proposed amendments

Gaps No. ¹ 109, 174,176 and 181	
Related documents, if any:	
Action requested:	Addition, deletion and modification
Available evidence, data, research, etc., if any, to support the proposed amendments:	N/A
Voluntary assessment on the possible cumulative impact (if the proposal aims at adding new training requirements, provide information on the cumulative impact on seafarer's training/certification and possible measures to address the impact):	Information on the cumulative impact: As the proposal contains new training requirements, it will add to the cumulative impact.
	Possible measures to address the cumulative impact:

Proposal

4 It is proposed to amend Section A-III/1, A-III/2 and A-III/6 of the Code as set out in the annex.

Action requested of the Sub-Committee

5 The Sub-Committee is invited to consider the information and proposals in paragraphs 3 and 4; and the annex, and take action, as appropriate.

¹ Gap No. is listed in annex to document HTW 12/6.

ANNEX

Proposed draft amendment to Section A-III/1, Section A-III/2 and Section A-III/6 of the Code

Sections A-III/1, A-III/2 and A-III/6 are proposed to be amended, as follows:

Table

A-III/1

Function: Marine engineering at the operational level

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</p> <p>.2 routine duties undertaken during a watch</p> <p>.3 maintenance of the machinery space logs and the significance of the readings taken</p> <p>.4 duties associated with handing over a watch Safety and emergency procedures; change-over of remote/automatic to local control of all systems</p> <p>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 systems</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p> <p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved training</p> <p>.2 approved in-service experience</p> <p>.3 approved simulator training</p>	<p>The conduct, handover and relief of the watch conforms with accepted principles and procedures</p> <p>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</p> <p>A proper record is maintained of the movements and activities relating to the ship's engineering systems</p> <p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p>

	<p><i>Engine room resource management</i></p> <p>Knowledge of engine room resource management principles, including:</p> <p>.1 allocation, assignment, and prioritization of resources</p> <p>.2 effective communication</p> <p>.3 assertiveness and leadership</p> <p>.4 obtaining and maintaining situational awareness</p> <p>.5 consideration of team experience</p>		<p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted engine room and associated systems state, and of external environment</p>
Use English in written and oral form	Adequate-Thorough knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties	Examination and assessment of evidence obtained from practical instruction	Examination and assessment of evidence obtained from practical instruction
Use internal communication systems	Operation of all internal communication systems on board	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Transmission and reception of messages are consistently successful</p> <p>Communication records are complete, accurate and comply with statutory requirements</p>
Operate main and auxiliary machinery	Basic construction and operation principles of machinery systems,	Examination and assessment of evidence obtained	Construction and operating mechanisms can be understood and

and associated control systems	including: .1 internal combustion marine diesel engine .2 marine steam turbine .3 marine gas turbine .4 marine boiler .5 shafting installations, including propeller .6 other auxiliaries, including various pumps, air compressor, purifier, fresh water generator, heat exchanger, refrigeration, air-conditioning and ventilation systems .7 steering gear .8 automatic control systems .9 emission reduction systems .10 fluid flow and characteristics of lubricating oil, fuel oil and cooling systems .11 deck machinery Safety and emergency procedures for operation of propulsion plant machinery, including control systems	from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved laboratory equipment training	explained with drawings/instructions
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Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate main and auxiliary machinery and associated	Preparation, operation, fault detection and necessary measures	Examination and assessment of evidence obtained from one or more of	Operations are planned and carried out in accordance with operating

<p>control systems (continued)</p>	<p>to prevent damage for the following machinery items and control systems:</p> <p>.1 main engine and associated auxiliaries</p> <p>.2 steam boiler and associated auxiliaries and steam systems</p> <p>.3 auxiliary prime movers and associated systems</p> <p>.4 other auxiliaries, including refrigeration, airconditioning and ventilation systems</p>	<p>the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment</p> <p>Deviations from the norm are promptly identified</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 ship and the plant, having regard to the prevailing circumstances and conditions</p>
<p>Operate fuel, lubrication, ballast and other pumping systems and associated control systems</p>	<p>Operational characteristics of pumps and piping systems, including control systems</p> <p>Operation of pumping systems:</p> <p>.1 routine pumping operations</p> <p>.2 operation of bilge, ballast and cargo pumping systems</p> <p>Oily-water separators (or-similar equipment) requirements and operation</p> <p>Ability to operate ballast water</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment</p> <p>Deviations from the norm are promptly identified and appropriate action is taken</p> <p>Ballast water operations are carried out in accordance with established regulations and procedures</p>

	management and treatment system		
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Function: Electrical, electronic and control engineering at the operational level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate electrical, electronic and control systems	<p>Basic configuration and operation principles of the following electrical, electronic and control equipment:</p> <p>.1 electrical equipment:</p> <p>.a generator and distribution systems</p> <p>.b preparing, starting, paralleling and changing over generators</p> <p>.c electrical motors including starting methodologies</p> <p>.d high-voltage installations</p> <p>.e sequential control circuits and associated system devices</p> <p>.f auxiliary plant technical systems</p> <p>.2 electronic equipment:</p> <p>.a characteristics of basic electronic circuit elements</p> <p>.b flowchart for automatic and control systems</p> <p>.c functions, characteristics and features of control systems for machinery items, including main propulsion plant operation control and steam boiler automatic controls</p> <p>.3 control systems:</p> <p>.a various automatic</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</p> <p>Electrical, electronic and control systems can be understood and explained with drawings/instructions</p>

	<p>control methodologies and characteristics</p> <p>.b Proportional–Integral–Derivative (PID) control characteristics and associated system devices for process control</p> <p>.4 automation systems:</p> <p>. a fundamentals of automation</p> <p>. b function and configuration of programmable logic controllers (PLC)</p>		
Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintenance and repair of electrical and electronic equipment	<p>Safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before personnel are permitted to work on such equipment</p> <p>Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment</p> <p>Detection of electric malfunction, location of faults and measures to prevent damage</p> <p>Construction and operation of electrical testing and measuring equipment</p>	<p>Examination and 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>.3 approved in-service experience</p> <p>.4 approved training ship experience</p>	<p>Safety measures for working are appropriate</p> <p>Selection and use of hand tools, measuring instruments, and testing equipment are appropriate and interpretation of results is accurate</p> <p>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice</p> <p>Reassembling and performance testing is in accordance with manuals and good practice</p>

	<p>Function and performance tests of the following equipment and their configuration:</p> <p>.1 monitoring, automation and integrated automation systems</p> <p>.2 automatic control devices</p> <p>.3 protective devices</p> <p>The interpretation of electrical and simple electronic diagrams</p>		
Operate digital systems, computers and network infrastructure on ships	<p>Knowledge of</p> <p>.1 main design features of digital interfaces</p> <p>.2 construction and use of network infrastructure on ships</p> <p>.3 Set up and configuration of Computers</p> <p>4. industrial computer technology (industrial-PC, programmable logic controllers) and industrial data communication</p> <p>5. Communications network bus systems</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 examination</p> <p>.2 approved simulator training</p> <p>.3 approved laboratory equipment training</p>	<p>Operation / building and fault finding in network system</p> <p>Operation of real life system or simulators to troubleshoot and find solutions and possible reasons for fault</p>

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

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

<p>Ensure compliance with pollution-prevention requirements</p>	<p><i>Prevention of pollution of the marine environment</i></p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</p> <p>Knowledge of the negative environmental impact of ballast water exchange and preventive measures against unintentional transport of invasive species and pathogens from one region to another</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved training</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL and BWM Convention requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>
<p>Maintain seaworthiness of the ship</p>	<p><i>Ship stability</i></p> <p>Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment</p> <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>Ship construction</i></p> <p>General knowledge of the principal structural members of a ship</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Shipboard activities which can impact the stability of the ship (e.g. fuel transfer, ballast transfer, etc.) are handled appropriately and safely.</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

	and the proper names for the various parts		
Prevent, control and fight fires on board	<p><i>Fire prevention and fire-fighting appliances</i></p> <p>Ability to organize fire drills</p> <p>Knowledge of classes and chemistry of fire</p> <p>Knowledge of fire-fighting systems</p> <p>Action to be taken in the event of fire, including fires involving oil systems</p>	Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3, paragraphs 1 to 3	<p>The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship</p> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The order of priority, and the levels and time-scales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem</p>
Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate life-saving appliances	<p><i>Life-saving</i></p> <p>Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids</p>	Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4	Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards
Apply medical first aid on board ship	<p><i>Medical aid</i></p> <p>Practical application of</p>	Assessment of evidence obtained from approved	Identification of probable cause, nature and extent of

	<p>medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship</p>	<p>training as set out in section A-VI/4, paragraphs 1 to 3</p>	<p>injuries or conditions is prompt and treatment minimizes immediate threat to life</p>
<p>Monitor compliance with legislative requirements</p>	<p>Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment</p> <p>Knowledge of the Ballast Water Convention and its requirements, national regulations and the importance of maintaining accurate records using ballast water record book</p>	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>
<p>Application of leadership and teamworking skills</p>	<p>Working Knowledge of shipboard personnel management and training including Maritime Crew Resource Management (MCRM)</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Knowledge of the risk of complacency</p> <p>Ability to apply task and workload management, including:</p> <p>.1 planning and coordination</p> <p>.2 personnel assignment</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved training</p> <p>.2 approved in-service experience</p> <p>.3 practical demonstration</p>	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements.</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed</p>

	<p>.3 time and resource constraints</p> <p>.4 prioritization</p> <p>Knowledge and ability to apply effective resource management:</p> <p>.1 allocation, assignment, and prioritization of resources</p> <p>.2 effective communication on board and ashore</p> <p>.3 decisions reflect consideration of team experiences</p> <p>.4 assertiveness and leadership, including motivation</p> <p>.5 obtaining and maintaining situational awareness</p> <p>.6 effective communication and cooperation with shore-based support teams providing remote assistance</p> <p>Knowledge and ability to apply decision-making techniques:</p> <p>.1 situation and risk assessment</p> <p>.2 identify and consider generated options</p> <p>.3 selecting course of action</p>		<p>in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment</p> <p>Decisions are most effective for the situation</p>
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	.4 evaluation of outcome effectiveness		
Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the safety of personnel and ship	<p>Knowledge of personal survival techniques</p> <p>Knowledge of fire prevention and ability to fight and extinguish fires</p> <p>Knowledge of elementary first aid</p> <p>Knowledge of personal safety and social responsibilities</p>	Assessment of evidence obtained from approved training and experience as set out in section A-VI/1, paragraph 2	<p>Appropriate safety and protective equipment is correctly used</p> <p>Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times</p> <p>Procedures designed to safeguard the environment are observed at all times</p> <p>Initial and follow-up actions on becoming aware of an emergency conform with established emergency response procedures</p>

Table A-III/2

Function: Marine engineering at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Manage the operation of propulsion plant machinery	<p>Design features, and operative mechanism of the following machinery and associated auxiliaries:</p> <p>.1 marine diesel internal combustion engine</p> <p>.2 marine steam turbine</p> <p>.3 marine gas turbine</p> <p>.4 marine steam boiler</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Explanation and understanding of design features and operating mechanisms are appropriate</p>
Plan and schedule operations	<p><i>Theoretical knowledge</i></p> <p>Thermodynamics and heat transmission</p> <p>Mechanics and hydromechanics</p> <p>Propulsive characteristics of diesel internal combustion engines, steam and gas turbines, including speed, output and fuel consumption</p> <p>Heat cycle, thermal efficiency and heat balance of the following:</p> <p>.1 marine diesel internal combustion engine</p> <p>.2 marine steam turbine</p> <p>.3 marine gas turbine</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The planning and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage</p>

	.4 marine steam boiler		
Plan and schedule operations (continued)	Refrigerators and refrigeration cycle Physical and chemical properties of fuels and lubricants Technology of materials Naval architecture and ship construction, including damage control		
Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery	<i>Practical knowledge</i> Start up and shut down main propulsion and auxiliary machinery, including associated systems Operating limits of propulsion plant The efficient operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery Assess emissions caused by ship operations and use systems in a targeted manner to reduce environmental impact. Functions and mechanism of automatic control for main engine Functions and mechanism of automatic control for auxiliary machinery including but not limited to: .1 generator distribution systems .2 steam boilers .3 oil purifier .4 refrigeration system	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	The methods of preparing for the start-up and of making available fuels, lubricants, cooling water and air are the most appropriate Checks of pressures, temperatures and revolutions during the start-up and warm-up period are in accordance with technical specifications and agreed work plans Surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operating conditions The methods of preparing the shutdown, and of supervising the cooling down of the engine are the most appropriate The methods of measuring the load capacity of the engines are in accordance with technical specifications

Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery (continued)	.5 pumping and piping systems .6 steering gear system .7 cargo-handling equipment and deck machinery		Performance is checked against bridge orders Performance levels are in accordance with technical specifications
Manage fuel, lubrication and ballast operations	Operation and maintenance of machinery, including such as pumps, and piping systems and ballast water treatment systems	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate	Fuel and ballast operations meet operational requirements and are carried out so as to prevent pollution of the marine environment

Function: Electrical, electronic and control engineering at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Manage operation of electrical and electronic control equipment	<i>Theoretical knowledge</i> Marine electrotechnology, electronics, power electronics, automatic control engineering and safety devices Design features and system configurations of automatic control equipment and safety devices for the following:	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience	Operation of equipment and system is in accordance with operating manuals Performance levels are in accordance with technical specifications
Manage operation of	.1 main engine	.3 approved simulator training, where	

electrical and electronic control equipment (continued)	.2 generator and distribution system .3 steam boiler Design features and system configurations of operational control equipment for electrical motors Design features of high-voltage installations Features of hydraulic and pneumatic control equipment	appropriate .4 approved laboratory equipment training	
Manage trouble-shooting, restoration of electrical and electronic control equipment to operating condition	<i>Practical knowledge</i> Troubleshooting of electrical and electronic control equipment Function test of electrical, electronic control equipment and safety devices Troubleshooting of monitoring automation and integrated automation systems Software version control	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Maintenance activities are correctly planned in accordance with technical, legislative, safety and procedural specifications Inspection, testing and troubleshooting of equipment are appropriate

Function: Maintenance and repair at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Manage safe and effective maintenance and repair procedures	<i>Theoretical knowledge</i> Marine engineering practice <i>Practical knowledge</i> Manage safe and effective maintenance and repair procedures	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience	Maintenance activities are correctly planned and carried out in accordance with technical, legislative, safety and procedural specifications Appropriate plans, specifications, materials and

	Planning maintenance, including statutory and class verifications Planning repairs	.3 approved workshop training	equipment are available for maintenance and repair Action taken leads to the restoration of plant by the most suitable method
Detect and identify the cause of machinery malfunctions and correct faults	<i>Practical knowledge</i> Detection of machinery malfunction, location of faults and action to prevent damage Inspection and adjustment of equipment Non-destructive examination	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	The methods of comparing actual operating conditions are in accordance with recommended practices and procedures Actions and decisions are in accordance with recommended operating specifications and limitations
Ensure safe working practices	<i>Practical knowledge</i> Safe working practices	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved laboratory equipment training	Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns

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

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Control trim, stability and stress	Understanding of fundamental principles of ship construction and the	Examination and assessment of evidence obtained	Stability and stress conditions are

	<p>theories and factors affecting trim and stability and measures necessary to preserve trim and stability</p> <p>Knowledge of the effect on trim and stability of a ship in the event of damage to, and consequent flooding of, a compartment and countermeasures to be taken</p> <p>Knowledge of IMO recommendations concerning ship stability</p>	<p>from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>maintained within safety limits at all times</p>
<p>Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security and protection of the marine environment</p>	<p>Knowledge of relevant international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <p>.1 certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity</p> <p>.2 responsibilities under the relevant requirements of the International Convention on Load Lines, 1966, as amended</p> <p>.3 responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea, 1974, as amended</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>Procedures for monitoring operations and maintenance comply with legislative requirements</p> <p>Potential non-compliance is promptly and fully identified</p> <p>Requirements for renewal and extension of certificates ensure continued validity of survey items and equipment</p>
<p>Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and protection of</p>	<p>.4 responsibilities under the International Convention for the Prevention of Pollution from Ships, as amended</p> <p>.5 maritime declarations of health and the requirements of the</p>		

<p>the marine environment (continued)</p>	<p>International Health Regulations</p> <p>.6 responsibilities under international instruments affecting the safety of the ships, passengers, crew or cargo</p> <p>.7 methods and aids to prevent pollution of the environment by ships</p> <p>.8 knowledge of national legislation for implementing international agreements and conventions</p>		
<p>Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems</p>	<p>A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea)</p> <p>Organization of fire and abandon ship drills</p> <p>Maintenance of operational condition of life-saving, fire-fighting and other safety systems</p> <p>Actions to be taken to protect and safeguard all persons on board in emergencies</p> <p>Actions to limit damage and save the ship following fire, explosion, collision or grounding</p>	<p>Examination and assessment of evidence obtained from practical instruction and approved in-service training and experience</p>	<p>Procedures for monitoring fire-detection and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established emergency procedures</p>
<p>Develop emergency and damage control plans and handle emergency situations</p>	<p>Ship construction, including damage control</p> <p>Methods and aids for fire prevention, detection and extinction</p> <p>Functions and use of life-saving appliances</p>	<p>Examination and assessment of evidence obtained from approved in-service training and experience</p>	<p>Emergency procedures are in accordance with the established plans for emergency situations</p>
<p>Use leadership and managerial skills</p>	<p>Knowledge of shipboard personnel management and training</p>	<p>Assessment of evidence obtained from one or more of the following:</p>	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to</p>

	<p>A knowledge of international maritime conventions and recommendations, and related national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> .1 planning and coordination .2 personnel assignment .3 time and resource constraints .4 prioritization <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore .3 decisions reflect consideration of team experience 	<ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 approved simulator training 	<p>the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p>
<p>Use leadership and managerial skills (continued)</p>	<ul style="list-style-type: none"> .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situation awareness <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> .1 situation and risk assessment .2 identify and generate options .3 select course of action .4 evaluation of outcome effectiveness 		<p>Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment</p> <p>Decisions are most effective for the situation</p> <p>Operations are demonstrated to be effective and in accordance with applicable rules</p>

	Development, implementation, and oversight of standard operating procedures		
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Table A-III/6

Function: Electrical, electronic and control engineering at the operational level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Monitor the operation of electrical, electronic and control systems</p>	<p>Basic understanding of the operation of mechanical engineering systems, including:</p> <ul style="list-style-type: none"> .1 prime movers, including main propulsion plant .2 engine-room auxiliary machinery .3 steering systems .4 cargo handling systems .5 deck machinery .6 hotel systems <p>Basic knowledge of heat transmission, mechanics and hydromechanics</p> <p><i>Knowledge of:</i></p> <p>Electro-technology and electrical machines theory</p> <p>Fundamentals of electronics and power electronics</p> <p>Electrical power distribution boards and electrical equipment</p> <p>Fundamentals of automation, automatic control systems and technology</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training 	<p>Operation of equipment and system is in accordance with operating manuals</p> <p>Performance levels are in accordance with technical specifications</p>

<p>Monitor the operation of electrical, electronic and control systems (continued)</p>	<p>Instrumentation, alarm and monitoring systems</p> <p>Electrical drives</p> <p>Technology of electrical materials</p> <p>Electro-hydraulic and electro-pneumatic control systems</p> <p>Appreciation of the hazards and precautions required for the operation of power electrical systems above 1,000 volts</p>		
<p>Monitor the operation of automatic control systems of propulsion and auxiliary machinery</p>	<p>Preparation of control systems of propulsion and auxiliary machinery for operation</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operation condition</p>
<p>Operate generators, and distribution systems and battery systems</p>	<p>Coupling, load sharing and changing over generators</p> <p>Coupling and breaking connection between switchboards and distribution panels</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</p> <p>Electrical distribution systems can be understood and explained with drawings/instructions</p>

		.4 approved laboratory equipment training	
Operate and maintain power systems in excess of 1,000 volts high voltage installations	<p><i>Theoretical knowledge</i></p> <p>High-voltage technology</p> <p>Safety precautions and procedures</p> <p>Electrical propulsion of the ships, electrical motors and control systems</p> <p><i>Practical knowledge</i></p> <p>Safe operation and maintenance of high-voltage systems, including understanding the specific technical characteristics of such systems and the danger and risks associated with various operational voltages. associated with exposure to elevated various operational voltages knowledge of the special technical type of high-voltage systems and the danger resulting from operational voltage of more than 1,000 volts</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations
Operate computers and computer networks on ships	<p>Understanding of:</p> <p>.1 main features of data processing</p> <p>.2 construction and use of computer networks on ships</p> <p>.3 bridge-based, engine-room-based and commercial computer use</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where</p>	Computer networks and computers are correctly checked and handled

		appropriate .4 approved laboratory equipment training	
Operate and repair digital systems, computers and network infrastructure on ships.	Understanding of: .1 main design features of digital interfaces .2 construction and use of network infrastructure on ships .3 Ability to identify, analyse, and resolve issues across interconnected systems and data networks 4. industrial computer technology (industrial-PC, programmable logic controllers) and industrial data communication 5. communications network bus systems	Examination and assessment of evidence obtained from one or more of the following: .1 examination .2 approved simulator training .3 approved training ship experience .4 approved laboratory equipment training	Operation / building and fault finding in network system Operation of real life system or simulators to troubleshoot and find solutions and possible reasons for fault
Use English in written and oral form	Thorough knowledge of the English language to enable the officer to use engineering publications and to perform the officer's duties	Examination and assessment of evidence obtained from practical instructions	English language publications relevant to the officer's duties are correctly interpreted Communications are clear and understood
Use internal communication systems	Operation of all internal communication systems on board	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate	Transmission and reception of messages are consistently successful Communication records are complete, accurate and comply with statutory requirements

		.4 approved laboratory equipment training	
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