

Part B - Recommended guidance regarding provisions of the 1978 STCW Convention, as amended.

Each section of the STCW Code refers to each regulation annexed to the Convention.

IMO-Vega Note

The 2010 amendments to the STCW Code, as adopted by Resolution 2 to the Final Act of the Manila Conference, will enter into force 2012-01-01. See corresponding section applicable to 2012-01-01.

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The STCW Code Part A is made mandatory in the STCW Convention Reg. I/1 paragraph 2.

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The 2010 Manila Amendments to the Seafarers' Training, Certification and Watchkeeping (STCW) Code

3 August 2010

PART A

Mandatory standards regarding provisions of the annex to the STCW Convention

CHAPTER III

Standards regarding engine department

Section A-III/6

Mandatory minimum requirements for certification of electro-technical officers

Applicable from 2012-01-01, see IMO-Vega Note

Training

1 The education and training required by paragraph 2.3 of regulation III/6 shall include training in electronic and electrical workshop skills relevant to the duties of electro-technical officer.

Onboard training

2 Every candidate for certification as electro-technical officer shall follow an approved programme of onboard training which:

- .1 ensures that, during the required period of seagoing service, the candidate receives systematic practical training and experience in the tasks, duties and responsibilities of an electro-technical officer;
- .2 is closely supervised and monitored by qualified and certificated officers aboard the ships in which the approved seagoing service is performed; and
- .3 is adequately documented in a training record book.

Standard of competence

3 Every candidate for certification as electro-technical officer shall be required to demonstrate the ability to undertake the tasks, duties and responsibilities listed in column 1 of table A-III/6.

4 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/6 and it shall take into account the guidance given in part B of this Code.

5 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence tabulated in columns 3 and 4 of table A-III/6.

Table A-III/6

Specification of minimum standard of competence for electro-technical officers

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

| Column 1 | Column 2 | Column 3 | Column 4 |
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| Competence | Knowledge, understanding and proficiency | Methods for demonstrating competence | Criteria for evaluating competence |
| Monitor the operation of electrical, electronic and control systems | <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> |
| Monitor the | Instrumentation, alarm | | |

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

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| | <p><i>Practical knowledge</i></p> <p>Safe operation and maintenance of high-voltage systems, including 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>ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p> | |
| 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 appropriate</p> <p>.4 approved laboratory equipment training</p> | Computer networks and computers are correctly checked and handled |
| Use English in written and oral form | Adequate 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 | <p>English language publications relevant to the officer's duties are correctly interpreted</p> <p>Communications are clear and understood</p> |
| 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> |

Function: Maintenance and repair at the operational level

| Column 1 | Column 2 | Column 3 | Column 4 |
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| Competence | Knowledge, understanding and proficiency | Methods for demonstrating competence | Criteria for evaluating competence |
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| 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, generators 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>Function and performance tests of the following equipment and their configuration:</p> <ul style="list-style-type: none"> .1 monitoring systems .2 automatic control devices .3 protective devices .4 The interpretation of electrical and electronic diagrams | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved workshop skills training .2 approved practical experience and tests .3 approved in-service experience .4 approved training ship experience | <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> |
| Maintenance and repair of automation and control systems of main propulsion and auxiliary machinery | <p>Appropriate electrical and mechanical knowledge and skills</p> <p><i>Safety and emergency procedures</i></p> <p>Safe isolation of equipment and associated systems required before personnel are permitted to work on such plant or equipment</p> <p>Practical knowledge for</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 | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and reassembly of plant and equipment are in accordance with manufacturer's safety</p> |

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| | <p>the testing, maintenance, fault finding and repair</p> <p>Test, detect faults and maintain and restore electrical and electronic control equipment to operating condition</p> | equipment training | <p>guidelines and shipboard instructions and legislative and safety specifications. Action taken leads to the restoration of automation and control systems by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |
| <p>Maintenance and repair of bridge navigation equipment and ship communication systems</p> | <p>Knowledge of the principles and maintenance procedures of navigation equipment, internal and external communication systems</p> <p><i>Theoretical knowledge:</i></p> <p>Electrical and electronic systems operating in flammable areas</p> <p><i>Practical knowledge:</i></p> <p>Carrying out safe maintenance and repair procedures</p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</p> | | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and re-assembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of bridge navigation equipment and ship communication systems by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |
| <p>Maintenance and repair of electrical, electronic and control systems of deck machinery and cargo-handling equipment</p> | <p>Appropriate electrical and mechanical knowledge and skills</p> <p>Safety and emergency procedures</p> <p>Safe isolation of equipment and associated systems required before personnel are permitted to work on such plant or equipment</p> <p>Practical knowledge for the testing, maintenance, fault finding and repair</p> <p>Test, detect faults and maintain and restore</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 training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and re-assembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the</p> |

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| | <p>electrical and electronic control equipment to operating condition</p> <p>Theoretical knowledge: Electrical and electronic systems operating in flammable areas</p> <p>Practical knowledge: Carrying out safe maintenance and repair procedures</p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</p> | | <p>restoration of deck machinery and cargo-handling equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |
| <p>Maintenance and repair of control and safety systems of hotel equipment</p> | <p><i>Theoretical knowledge:</i> Electrical and electronic systems operating in flammable areas</p> <p><i>Practical knowledge:</i> Carrying out safe maintenance and repair procedures</p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</p> | | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and re-assembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of control and safety systems of hotel equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |

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

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

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| <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>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 pollution-prevention requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p> |
| <p>Prevent, control and fight fire on board</p> | <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> | <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> | <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> |
| <p>Operate life-saving appliances</p> | <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> | <p>Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4</p> | <p>Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards</p> |
| <p>Apply medical first aid on</p> | <p><i>Medical aid</i></p> <p>Practical application of</p> | <p>Assessment of evidence obtained from</p> | <p>Identification of probable cause, nature</p> |

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| board ship | 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 | approved training as set out in section A-VI/4, paragraphs 1 to 3 | and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life |
| Application of leadership and teamworking skills | <p>Working knowledge of shipboard personnel management and training</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> .1 planning and co-ordination .2 personnel assignment .3 time and resource constraints .4 prioritization | <p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 practical demonstration | <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> |
| Application of leadership and teamworking skills (continued) | <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 experiences .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situational 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 consider generated options .3 Selecting course of action .4 Evaluation of outcome effectiveness | | <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>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> |
| Contribute to | Knowledge of personal | Assessment of | Appropriate safety and |

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| <p>the safety of personnel and ship</p> | <p>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> | <p>evidence obtained from approved training and experience as set out in section A-VI/1, paragraph 2</p> | <p>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> |
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IMO-Vega Guide

The STCW Code comprises two parts:

Part A - Mandatory standards regarding provisions of the Annex to the 1978 STCW Convention, as amended, and

Part B - Recommended guidance regarding provisions of the 1978 STCW Convention, as amended.

Each section of the STCW Code refers to each regulation annexed to the Convention.

IMO-Vega Note

The 2010 amendments to the STCW Code, as adopted by Resolution 2 to the Final Act of the Manila Conference, will enter into force 2012-01-01.

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