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Agenda item 7.3

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COMPREHENSIVE REVIEW OF THE STCW CONVENTION AND THE STCW CODE

Chapter III of the STCW Convention and Code

Training and certification requirements for electro-technical officer and able seafarer electro-engineering

Submitted by Germany

SUMMARY

Executive summary:	This document comments on the proposals regarding minimum requirements for certification of electro-technical officer (proposed regulation III/6) and of senior electro-technical officer (proposed regulation III/7) of document STW 40/7/6
Strategic direction:	5
High-level action:	5.2.2
Planned output:	5.2.2.1
Action to be taken:	Paragraph 8
Related documents:	STW 39/7/12, STW 39/12; STW 40/7/3 and STW 40/7/6

Background

1 The Sub-Committee on Standards of Training and Watchkeeping (STW), at its thirty-ninth session (3 to 7 March 2008) agreed that, in order to make significant progress in the comprehensive review of the STCW Convention and the STCW Code before STW 40 in 2009, it would be essential to hold an *ad hoc* intersessional meeting of the STW working group.

2 The Maritime Safety Committee, at its eighty-fourth session (7 to 16 May 2008), approved the updated work programme for the above mentioned review process as proposed by the STW Sub-Committee.

3 The *ad hoc* intersessional STW working group relating to the comprehensive review of the STCW Convention and the STCW Code, at its first meeting (8 to 12 September 2008), prepared the preliminary revised draft of chapter III of the STCW Convention and Code for further consideration by STW 40.

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4 Accordingly, the working group invited Governments and international organizations to submit comments and proposals to the 40th session of the STW Sub-Committee.

Proposal

5 The use of new technologies in ship operation as well as automation and control by means of computer-based systems call for new specific knowledge, skills and abilities of specialized crew members. In most cases it seems to be sufficient to have a qualification at the support level as able seafarer electro-engineering. However, in some circumstances or on special types of ships (e.g., passenger ships) there could be a need for more qualified personnel. Therefore it is proposed to introduce an additional level of competence, the electro-technical officer at operational level.

6 Today a large number of shore-based educated electricians are serving on board ships. Up to now there is no possibility to issue adequate STCW certificates in relation to their professional competence. Furthermore, all previous proposals to the Sub-Committee in this regard do not contribute to significant changes for this group of seafarers. On the other hand, for the much smaller group of existing electro-engineers on board, there are proposals to introduce standards of competence at operational as well as the management level; that means two different certificates of competency.

7 Taking into account the agreed position that it should be an option to sail specialists in the electro-technical branch it seems not adequate still to exclude a large group of seafarers from relevant certification and to produce provisions dividing the smaller group into two different levels of certification.

Action requested of the Sub-Committee

8 The Sub-Committee is invited to take the proposal contained in annexes 1 and 2 into consideration and decide as appropriate.

ANNEX 1

PROPOSED AMENDMENTS TO CHAPTER III OF THE INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION AND WATCHKEEPING FOR SEAFARERS (STCW), 1978, AS AMENDED**Chapter III****Engine department****Regulation III/6**

Mandatory minimum requirements for certification of ratings as able seafarer electro-engineering in a manned engine-room or designated to perform duties in a periodically unmanned engine-room

1 Every able seafarer electro-engineering serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall be duly certificated.

2 Every candidate for certification shall:

- .1 be not less than 18 years of age;
- .2 meet the requirements for certification as a rating forming part of a watch in a manned engine-room or designated to perform duties in a periodically unmanned engine-room;
- .3 while qualified to serve as a rating forming part of an engineering watch, have approved seagoing service in the engine department:
 - .3.1 not less than 12 months, or
 - .3.2 not less than 6 months and have completed approved training; and
- .4 meet the standard of competence specified in section A-III/6 of the STCW Code.

3 Every Party shall compare the standards of competence which it required of ratings in the engine department responsible for electrical devices for certificates issued before [date] with those specified for the certificate in section A-III/6 of the STCW Code, and shall determine the need, if any, for requiring these personnel to update their qualifications.

4 Seafarers may be considered by the Party to have met the requirements of this regulation if they have served in a relevant capacity in the engine department for a period of not less than 12 months within the last five years preceding the entry into force of this regulation for that Party.

Regulation III/7

Mandatory minimum requirements for certification of electro-technical officers on ships powered by main propulsion machinery of 750 kW propulsion power or more

1 Every electro-technical officer serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall hold an appropriate certificate.

2 Every candidate for certification shall:

- .1 be not less than 18 years of age;
- .2 have approved seagoing service of not less than six months as part of an approved training which includes on-board training which meets the requirements of section A-III/7 of the STCW Code and is documented in an approved training record book; and
- .3 have completed approved education and training and meet the standard of competence specified in section A-III/7 of the STCW Code.

3 Every Party shall compare the standard of competence which it required of electro-technical officers for certificates issued before [date] with those specified for the certificate in section A-III/7 of the STCW Code, and shall determine the need, if any, for requiring those personnel to update their qualifications.

4 Seafarers may be considered by the Administration to have met the requirements of this regulation if they have served in a relevant capacity on board a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more for a period of not less than 12 months within the last five years preceding the entry into force of this regulation for that Party and meet the competence specified in section A-III/7 of the STCW Code.

ANNEX 2

**PROPOSED AMENDMENTS TO THE SEAFARER'S TRAINING, CERTIFICATION
AND WATCHKEEPING (STCW) CODE****Part A
Chapter III****Standards regarding the engine department****Section A-III/6**

Mandatory minimum requirements for certification of ratings as able seafarer electro-engineering in a manned engine-room or designated to perform duties in a periodically unmanned engine-room Standard of competence

- 1 Every able seafarer electro-engineering serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall be required to demonstrate the competence to perform the functions at the support level, as specified in column 1 of table A-III/6.
- 2 The minimum knowledge, understanding and proficiency required of an able seafarer electro-engineering serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more is listed in column 2 of table A-III/6.
- 3 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence specified in columns 3 and 4 of table A-III/6.

Table A-III/6

**Specification of minimum standards of competence of ratings as able seafarer
 electro-engineering in a manned engine-room or designated to perform duties
 in a periodically unmanned engine-room**

Function: Marine engineering at the support level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to a safe engineering watch	Ability to understand orders and to communicate with the officer of the watch in matters relevant to watchkeeping duties Procedures for the relief, maintenance and handover of a watch information required to maintain a safe watch	Assessment of evidence obtained from in-service experience or practical test	Communications are clear and concise maintenance, handover and relief of the watch is in conformity with acceptable practices and procedures
Contribute to the monitoring and controlling of an engine room watch	Basic knowledge of the function and operation of main propulsion and auxiliary machinery Basic understanding of main propulsion and auxiliary machinery control pressures, temperature and levels	Assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience; or .3 practical test	The frequency and extent of monitoring of main propulsion and auxiliary machinery conforms with accepted principles and procedures Deviations from the norm are identified. Unsafe conditions or potential hazards are promptly recognized, reported and rectified before work continues
Contribute to fuelling and oil transfer operations	Basic knowledge of the function and operation of fuel system and oil transfer operations, including:	Assessment of evidence obtained from one or more of the following:	Transfer operations are carried out in accordance with established safety practices and

	<ul style="list-style-type: none"> .1 preparations for fuelling and transfer operations; .2 procedures for connecting and disconnecting fuelling and transfer hoses; .3 procedures relating to incidents that may arise during fuelling or transferring operation; .4 securing from fuelling and transfer operations; .5 ability to correctly measure and report tank levels 	<ul style="list-style-type: none"> .1 approved in-service experience; .2 practical training; .3 examination; .4 approved training ship experience. <p>Assessment of evidence obtained from practical demonstration</p>	<p>equipment operating instructions</p> <p>The handling of dangerous, hazardous and harmful liquids complies with established safety practices</p> <p>Communications within the operator's area of responsibility are consistently successful</p>
Contribute to bilge and ballast operations	<p>Basic knowledge of the safe function, operation and maintenance of the bilge and ballast systems, including:</p> <ul style="list-style-type: none"> .1 reporting incidents associated with transfer operations; .2 ability to correctly measure and report tank levels 	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience; .2 practical training; .3 examination; .4 approved training ship experience <p>Assessment of evidence obtained from practical demonstration</p>	<p>Operations and maintenance are carried out in accordance with established safety practices and equipment operating instructions and pollution of the marine environment is avoided</p> <p>Communications within the operator's area of responsibility are consistently successful</p>
<p>Contribute to the operation of equipment and machinery</p> <p>Safe use of electrical equipment</p>	<p>Safe operation of equipment, including:</p> <ul style="list-style-type: none"> .1 valves and pumps; .2 hoists and lifting equipment; .3 hatches, watertight doors, ports and related equipment. <p>Ability to use and understand basic crane, winch and hoist signals</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience; .2 practical training; .3 examination; .4 approved training ship experience. <p>Assessment of evidence obtained from practical demonstration</p>	<p>Operations are carried out in accordance with established safety practices and equipment operating instructions</p> <p>Communications within the operator's area of responsibility are consistently successful</p>

Function: Maintenance and repair at the support level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to shipboard maintenance and repair	<p>Knowledge of surface preparation techniques</p> <p>Ability to use painting, lubrication and cleaning materials and equipment</p> <p>Knowledge of safe disposal of waste materials</p> <p>Ability to understand and execute routine maintenance and repair procedures</p> <p>Understanding manufacturer's safety guidelines and shipboard instructions</p> <p>Knowledge of the application, maintenance and use of hand and power tools and measuring instruments and machine tools</p> <p>Knowledge of metal work</p>	<p>Assessment of evidence obtained from practical demonstration</p> <p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience;</p> <p>.2 practical training;</p> <p>.3 examination;</p> <p>.4 approved training ship experience</p>	<p>Maintenance activities are carried out in accordance with technical, safety and procedural specifications</p> <p>Selection and use of equipment and tools is appropriate</p>
<p>Contribute to shipboard maintenance and repair</p> <p>Automation and control systems of main propulsion and auxiliary machinery</p>	<p>Ability to understand and execute routine maintenance and repair procedures</p> <p>Understanding manufacturer's safety guidelines and shipboard instructions</p> <p>Knowledge of the application, maintenance and use of hand and power tools and measuring instruments</p>	<p>Assessment of evidence obtained from practical demonstration</p> <p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience;</p> <p>.2 practical training;</p> <p>.3 examination;</p> <p>.4 approved training ship experience</p>	<p>Maintenance activities are carried out in accordance with technical, safety and procedural specifications</p> <p>Selection and use of equipment and tools is appropriate</p>

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

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the handling of stores	Knowledge of procedures for safe handling, stowage and securing of stores	Assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 practical training; .3 examination; .4 approved training ship experience	Stores operations are carried out in accordance with established safety practices and equipment operating instructions The handling of dangerous, hazardous and harmful stores complies with established safety practices Communications within the operator's area of responsibility are consistently successful
Apply precautions and contribute to the prevention of pollution to the marine environment	Knowledge of the precautions to be taken to prevent pollution of the marine environment Knowledge of use and operation of anti-pollution equipment Knowledge of approved methods for disposal of marine pollutants	Assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 practical training; .3 examination; .4 approved training ship experience	Procedures designed to safeguard the marine environment are observed at all times
Apply occupational health and safety procedures	Working knowledge of safe working practices and personal shipboard safety, including: .1 electrical safety; .2 lockout/ tag out; .3 mechanical safety;	Assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 practical training;	Procedures designed to safeguard personnel and the ship are observed at all times Safe working practices are observed

	<ul style="list-style-type: none">.4 permit to work systems;.5 working aloft;.6 working in enclosed spaces;.7 lifting techniques and methods of preventing back injury;.8 chemical and biohazard safety;.9 personal safety equipment	<ul style="list-style-type: none">.3 examination;.4 approved training ship experience.	Appropriate safety and protective equipment is correctly used at all times
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Regulation III/7

Mandatory minimum requirements for certification of electro-technical officers on ships powered by main propulsion machinery of 750 kW propulsion power or more

Training

1 The education and training required by paragraph 2.3 of regulation III/7 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 program of onboard training which:

- .1 ensures that during 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 training record book.

Standard of competence

3 Every candidate for certification as electro-technical officer shall be required to demonstrate ability to undertake the tasks, duties and responsibilities listed in column 1 of table A-III/7.

4 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/7 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/7.

Table A-III/7

Specification of minimum standards of competence for electro-technical officers

Function: electrical, electronic and control engineering at operational level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor and evaluate the operation of electrical, electronic and control systems	<p>Theoretical knowledge and 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 machineries .3 steering systems .4 cargo handling systems .5 deck machineries .6 hotel systems <p><i>Knowledge of operation and maintenance 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 instrumentation,</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>The methods of measuring to evaluate the operation are in accordance with technical specifications</p> <p>Performance levels are in accordance with technical specifications</p>

	<p>Alarm and monitoring systems</p> <p>Electrical drives Technology of electrical materials Electro-hydraulic and electro-pneumatic control systems</p> <p>Appreciation of the hazards and precautions required for the operation of power systems above 1000 Volts</p> <p><i>Basic knowledge of:</i> Heat transmission, mechanics and hydromechanics</p>		
<p>Monitor and evaluate 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> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate 	<p>Surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operation condition</p> <p>The methods of measuring to evaluate the operation are in accordance with technical specifications</p> <p>Performance levels are in accordance with technical specifications</p>
<p>Monitor and evaluate the operation of generators</p>	<p>Coupling, load sharing and changing over generators</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 	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations</p> <p>The methods of measuring the load</p>

		.3 approved simulator training, where appropriate .4 approved laboratory equipment training	capacity of the generators and motors are in accordance with technical specifications Performance levels are in accordance with technical specifications
Operate and diagnose faults of computers and computer networks on ships	Understanding of: .1 main features of data processing .2 construction and use of computer networks on ships .3 bridge based, engine room based and commercial computer use Diagnose of faults in computer systems and networks	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	Computer networks and computers are correctly checked and handled
Operate power systems in excess of 1000 Volts.	Theoretical knowledge High voltage technology. Safety precautions and procedures Electrical propulsion of the ships, electrical motors and control systems <i>Practical knowledge</i> Safe operation 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 1000 V	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 established rules and procedures to ensure safety of operations

<p>Diagnose faults, maintain and restore electronic and control systems, navigation and communication equipment to operating condition</p>	<p>Understand and diagnose the underlying cause of malfunctions in electronic and control systems, navigation and communication systems and equipment</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 	<p>The methods of comparing actual operating conditions are in accordance with recommended practices</p> <p>Procedures Actions and decisions are in accordance with recommended operating specifications and limitations</p>
<p>Use hand tools, electrical and electronic measurement equipment for fault finding, maintenance and repair operations</p>	<p>Safety requirements for working on shipboard electrical systems.</p> <p>Knowledge of the causes of electric shock and precautions to be observed to prevent shock.</p> <p>Construction and operational characteristics of shipboard AC and DC systems and equipment</p> <p>Construction and operation of electrical test and measuring equipment</p> <p>Application of safe working practices</p>	<p>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 	<p>Implementation of safety procedures is satisfactory</p> <p>Recognizes and reports electrical hazards and unsafe equipment</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 to service after repair is in accordance with manuals and good practice</p>
<p>Use English in written and oral form</p>	<p>Adequate knowledge of the English language to enable the officer to use engineering publications</p>	<p>Examination and assessment of evidence obtained from practical</p>	<p>English language publications relevant to the officer's duties are</p>

	and to perform the officer's duties	instructions	correctly interpreted Communications are clear and understood
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Function: Maintenance and repair at operational level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain and repair automation and control systems of main propulsion and auxiliary machinery	<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 test, maintenance, fault finding and repair</p> <p>Test, detect faults and maintain and restore electrical and electronic control equipment to operating condition</p> <p>Knowledge of the principles and maintenance procedures of navigation equipment, internal and external communication system.</p> <p><i>Theoretical knowledge:</i></p> <p>Electrical and electronic systems operating in flammable areas</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 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 guidelines, 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>
Maintain and repair bridge navigation			The effect of malfunctions on associated plant and

<p>equipment and ship communication systems</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 damages</p>		<p>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 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>Maintain and repair electrical, electronic and control systems of deck machinery and cargo handling equipment</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 reassembly 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 deck machinery and cargo handling equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p>
<p>Maintain and repair control and safety systems of hotel equipment</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 reassembly of plant and equipment is in accordance with manufacturers 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</p>

			suitable and appropriate to the prevailing circumstances and conditions
Maintain and repair power systems in excess of 1000 Volts.	<p><i>Theoretical knowledge:</i> Safety precautions in repair situation</p> <p><i>Practical knowledge:</i> Safety procedure and maintenance of high voltage systems depending of the special technical type of high voltage systems from operational voltage of more than 1000 V</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 	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations

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

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Organize and manage subordinate crew	<p>Knowledge of personnel management, organization and training on board ships</p> <p>Knowledge of international maritime conventions and recommendations, and related national legislation</p>	Examination and assessment of evidence obtained from approved in service training and experience	<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 an assessment of current competence and capabilities and operational requirements</p>

<p>Ensure compliance with pollution prevention requirements</p>	<p>Prevention of pollution of the marine environment</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>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience .2 approved training ship experience</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p>
<p>Prevent, control and fight fire on board</p>	<p>Fire prevention and fire-fighting appliances</p> <p>Knowledge of fire prevention Ability to organize fire drills</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</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 appliance</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</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>radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids.</p> <p>Knowledge of survival at sea techniques</p>		
<p>Apply medical first aid on board ship</p>	<p>Practical application of 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>Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3</p>	<p>Identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life</p>
