

HTW  
1st session  
Agenda item 17

HTW 1/17  
29 November 2013  
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**DEVELOPMENT OF THE INTERNATIONAL CODE OF SAFETY FOR SHIPS  
USING GASES OR LOW-FLASHPOINT FUELS (IGF Code)**

**Development of training and certification requirements for seafarers  
for ships using gases or low-flashpoint fuels**

**Report of the Correspondence Group**

**Submitted by the United States**

**SUMMARY**

*Executive summary:* This document provides the outcome of the Correspondence Group on development of training and certification requirements for seafarers on board ships subject to the International Code of safety for ships using gases or low-flashpoint fuels (IGF Code)

*Strategic direction:* 5.2

*High-level action:* 5.2.1

*Planned output:* 5.25.2.1.3

*Action to be taken:* Paragraph 17

*Related documents:* STW 44/17/2, STW 44/17/3, STW 44/17/4, STW 44/17/5, STW 44/17/6, STW 44/17/WP.3, STW 44/17, STW 44/19, STW 44/INF.4, STW 44/INF.6 and MSC 92/26

**Introduction**

1 The STW Sub-Committee, at its forty-fourth session, agreed that the appropriate instrument to include training and certification provisions for personnel on ships using gases or other low-flashpoint fuels was chapter V of the STCW Convention and Code. Furthermore, the Sub-Committee agreed that MSC concurrence was necessary in order to start work on this issue. To further the work in this area, a correspondence group was established, subject to endorsement by the Maritime Safety Committee at its ninety-second session (12 to 21 June 2013) (MSC 92), under the coordination of the United States, with the following terms of reference:

- .1 The correspondence group, taking into account documents STW 44/17/2 (United States), STW 44/17/3 (Norway), STW 44/17/4 (Denmark), STW 44/17/5 (France) and STW 44/17/6 (ITF), and taking into account the relevant decisions and comments made at STW 44, should:

- .1 prepare the draft text of chapter V of the STCW Convention and Code on training and certification requirements for seafarers for ships using gases or other low-flashpoint fuels;
- .2 prepare final draft interim guidance on training for seafarers on ships using gases or other low-flashpoint fuels, based on document STW 44/17/5 (France); and
- .3 submit a report to HTW 1.

2 MSC 92 concurred with the view of the Sub-Committee that the appropriate instrument to include training and certification provisions for personnel on ships using gases or other low-flashpoint fuels was chapter V of the STCW Convention and Code.

3 The following Member States and non-governmental organizations participated in the correspondence group:

AUSTRALIA  
CANADA  
DENMARK  
FRANCE  
GERMANY

MARSHALL ISLANDS  
JAPAN  
NORWAY  
UNITED KINGDOM  
UNITED STATES

INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS)  
INTERNATIONAL CHAMBER OF SHIPPING (ICS)  
SOCIETY OF INTERNATIONAL GAS TANKER AND TERMINAL OPERATORS  
(SIGTTO)

4 The coordinator would like to express his sincere appreciation to all members of the correspondence group, whose support, cooperation and enthusiasm resulted in a substantial amount of work being completed.

#### **Drafting of text for amendments to the STCW Convention and Code**

5 In accordance with the terms of reference, the group agreed to develop amendments to chapter V of the STCW Convention and Code based on a number of documents submitted to STW 44. STW 44/INF.4 and STW 44/INF.6 served as the base documents for discussion of the multi-tiered structure of the proposed training. Documents STW 44/17/3 and STW 44/17/5 contained proposals on how each tier would be defined. Finally, document STW 44/17/2 formed the basis for discussions on how existing training and experience related to tanker operations could be assessed for compliance with the training to be developed by the correspondence group. Other important matters discussed included the identification of any existing training requirements currently developed and the general experience requirements necessary at each tier of the proposed training.

6 The majority of the responding members of the correspondence group felt that a three tiered structure was most appropriate, based upon document STW 44/INF.6 and incorporating elements from document STW 44/INF.4. The initial three tiers were familiarization, basic and advanced training. Subsequent discussions refined this decision into two levels of training – basic and advanced. Further, the majority of the group agreed that ship specific familiarization is a company responsibility and therefore, any requirements to address this issue should be included under STCW regulation I/14.

7 The correspondence group considered the relevance of existing liquefied gas or chemical tanker operations training. The majority of the group felt that liquefied gas tanker operations training could be taken into account, when assessing a seafarer's suitability to serve on a vessel subject to the IGF Code. It was agreed that for any such existing training to be accepted, that it must be at the same level and for the same gases. By making this decision, it alleviated the need for seafarers to complete a training course that may contain a substantial amount of previously learned material. However, the point was made that the shipboard systems can differ substantially aboard ships subject to the IGC Code. For this reason, consensus was reached that experience and familiarization requirements must be addressed in the draft amendments to the Convention and Code, however, the group was not able to reach a consensus on how this should be achieved.

8 A proposal was made during these discussions that instead of amending chapter V of the STCW Convention and Code, chapter III should be amended to include training of the fuels and equipment on board ships subject to the IGF Code. However, this proposal was found to be outside the terms of reference of this correspondence group. It was noted that a similar discussion took place at STW 44 and that when the number of ships subject to the IGF Code increased, it may be appropriate to modify chapters II and III, accordingly.

9 The group discussed the use of the term "low-flashpoint fuels" in the applicability of the requirements. Concerns were raised that the term includes a wide range of fuels, that most fuels are in fact "low-flashpoint" fuels, because by definition low-flashpoint fuels are all fuels with a flashpoint below 60° C. Consequently, the group agreed to use the term "fuels addressed by the IGF Code" to replace "gases and other low-flashpoint fuels" in the text. It is envisaged that by doing so, it will ensure that training complies with the design rules for IGF vessels and the applicability remains ships subject to the IGF Code.

10 The proposed draft amendments to chapter V of the STCW Convention, part A of the Code and part B of the Code are set out in annexes 1, 2 and 3, respectively.

#### **Drafting of text for the Interim Guidance**

11 Discussions of interim guidance for the training for seafarers on ships using gases or other low-flashpoint fuels was based on document STW 44/17/5, taking into account document STW 44/17/6 and the existing, related guidance found in resolution MSC.285(86). It is expected that the interim guidance developed would be used until the IGF Code enters into force in 2017.

12 As a result of the discussion, document STW 44/17/5 was modified to the format of a circular, while ensuring it matched the structure of the proposed amendments to chapter V of the STCW Convention and Code. Although many of the participants made editorial comments, the majority concurred with the draft document developed by the group.

13 However, one participant suggested that further development of the draft interim guidance was not necessary for the following reasons:

- .1 with the future entry into force of the IGF Code and these amendments to the STCW Code and Convention, the draft circular would be superseded very quickly; and
- .2 the content of the "Draft interim guidance" is very general and does not contribute to any significant technical content improvement relative to the existing text in the Interim Guidelines.

14 It was noted that the terms of reference require the development of the interim circular. The working group at STW 44 noted that the IGF Code would not be in force until 2017 and that interim guidance was needed until that time.

15 It was also suggested that the draft interim guidance would not function as an amendment to resolution MSC.285(86), *Interim Guidelines on safety for natural gas-fuelled engine installations in ships* because the resolution and the draft interim guidance are not compatible. The resolution addresses training in the use of fuels in addition to the natural gas fuelled ships that are subject to it. In addition, the training hierarchy of the draft circular presents significant differences to the text in the resolution.

16 Draft interim guidance on training for seafarers on ships subject to the IGF Code is given in annex 4.

**Action requested of the Sub-Committee**

17 The Sub-Committee is invited to consider the report of the correspondence group and take action, as appropriate.

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## ANNEX 1

### DRAFT AMENDMENT TO THE STCW CONVENTION

*Insert new regulation V/[3] after existing regulation V/2:*

"Regulation V/[3]

*Mandatory minimum requirements for the training and qualifications of masters, officers, ratings and other personnel on ships subject to the IGF Code*

1 This regulation applies to masters, officers and ratings serving on board ships subject to the IGF Code. Administrations shall determine the applicability of these requirements to personnel serving on ships using fuels addressed by the IGF Code engaged on domestic voyages.

2 Prior to being assigned shipboard duties on board ships subject to the IGF Code, engaged on international voyages, seafarers shall have completed the training required by paragraphs 4 to 7 below in accordance with their capacity, duties and responsibilities.

3 Seafarers who are required to be trained in accordance with paragraphs 5 below shall, at intervals not exceeding five years, undertake appropriate refresher training or be required to provide evidence of having achieved the required standard of competence within the previous five years.

4 All seafarers serving on board ships subject to the IGF Code shall, prior to being assigned shipboard duties, receive appropriate ship and equipment specific familiarization as specified in regulation I/14.5.

5 Seafarers responsible for designated safety duties on board ships subject to the IGF Code shall have completed basic training as specified in section A-V/[3], paragraph 1 of the STCW Code and shall hold a Certificate of Proficiency of the basic care and use of fuels on ships subject to the IGF Code.

6 Masters, engineer officers and all personnel with immediate responsibility for the care and use of fuels and fuel systems on ships subject to the IGF Code shall, while holding the Certificate of Proficiency described in paragraph 5;

- .1 have successfully completed the advanced training specified in section A-V/[3], paragraph 2 of the STCW Code;
- .2 completed at least three months of approved seagoing service that includes a minimum of three bunkering operations on onboard ships subject to the IGF Code; and
- .3 shall receive appropriate general and specific familiarization as specified in regulation I/14.5.

7 Masters, engineer officers and any person with immediate responsibility for the care and use of fuels on ships subject to the IGF Code who have been qualified and certified according to the standards of competence specified in section A-V/1-2-2 for service on liquefied gas tankers are to be considered as having met that specified in section A-V/[3-2] for gas-fuelled ships, provided they have also met the requirements of paragraphs 6.2 and 6.3.

8 Seafarers responsible for designated safety duties on board ships subject to the IGF Code shall have completed basic training as specified in section A-V/[3], paragraph 1 of the STCW Code and shall hold a Certificate of Proficiency of the care and use of fuels on ships subject to the IGF Code.

9 Administrations shall ensure that a Certificate of Proficiency is issued to seafarers, who are qualified in accordance with paragraphs 5 or 6 as appropriate, or that an existing Certificate of Competency or Certificate of Proficiency is duly endorsed."

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## ANNEX 2

### DRAFT AMENDMENT TO PART A OF THE STCW CODE

#### CHAPTER V

#### Standards regarding special training requirements for personnel on ships subject to the IGF Code

*Insert new section A-V/[3] after existing section A-V/2:*

"Section A-V/[3]

*Mandatory minimum requirements for the training and qualification of masters, officers,  
ratings and other personnel on ships subject to the IGF Code*

#### **Basic training of personnel with designated safety duties aboard ships subject to the IGF Code**

1 Every candidate for certification in basic training for ship's personnel aboard ships subject to the IGF Code shall:

- .1 have successfully completed the approved basic training required by regulation V/[3], paragraph 4, in accordance with their capacity, duties and responsibilities as set out in table A-V/[3-1]; and
- .2 be required to provide evidence that the required standard of competence has been achieved in accordance with the methods and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-V/[3-1].

#### **Advanced training of personnel aboard ships subject to the IGF Code**

2 Every candidate for certification advanced training for personnel aboard ships subject to the IGF Code:

- .1 have successfully completed the approved advanced training required by regulation V/[3], paragraph 5 in accordance with their capacity, duties and responsibilities as set out in table A-V/[3-2];
- .2 be required to provide evidence that the required standard of competence has been achieved in accordance with the methods and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-V/[3-2]; or
- .3. have received appropriate training and certification according to the requirements for service on liquefied gas tankers as set out in regulation V/[3], paragraph 7.

#### **Ship and equipment familiarization of personnel aboard ships subject to the IGF Code**

3 All seafarers serving on board ships subject to the IGF Code shall, prior to being assigned shipboard duties, receive appropriate ship and equipment specific familiarization as specified in regulation I/14.

**Table A-V/[3-1]**

*Specification of minimum standard of competence in the basic training of personnel aboard ships subject to the IGF Code*

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to the safe operation of a ship subject to the IGF Code	<p><i>Design and operational characteristics of ships subject to the IGF Code</i></p> <p>Basic knowledge of ships subject to the IGF Code, their fuel systems and fuel storage systems:</p> <p>1. fuels addressed by the IGF Code</p> <p>.2 types of fuel systems subject to the IGF Code</p> <p>.3 atmospheric, cryogenic or compressed storage of fuels on board ships subject to the IGF Code</p> <p>.4 general arrangement of fuel storage systems on board ships subject to the IGF Code</p> <p>.5 hazard and Ex-zones and areas</p> <p>.6 typical fire safety plan</p> <p>.7 monitoring, control and safety systems aboard ships subject to the IGF Code.</p> <p>Basic knowledge of fuels and fuel storage systems' operations on board ships subject to the IGF Code:</p> <p>.1 piping systems and valves</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</p> <p>.4 approved training programme</p>	<p>Communications within the area of responsibility are clear and effective</p> <p>Operations related to ship subject to the IGF Code are carried out in accordance with accepted principles and procedures to ensure safety of operations</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>.2 atmospheric, compressed or cryogenic storage</p> <p>.3 relief systems and protection screens</p> <p>.4 bunkering systems</p> <p>.5 protection against cryogenic accidents</p> <p>.6 fuel leak monitoring and detection</p> <p>Basic knowledge of the physical properties of fuels on board ship subject to the IGF Code, including:</p> <p>.1 properties and characteristics</p> <p>.2 pressure and temperature, including vapour pressure/ temperature relationship</p> <p>Knowledge and understanding of safety requirements and safety management on board ships subject to the IGF Code</p>		
<p>Take precautions to prevent hazards on a ship subject to the IGF Code</p>	<p>Basic knowledge of the hazards associated with operations on ships subject to the IGF Code, including:</p> <p>.1 health hazards</p> <p>.2 environmental hazards</p> <p>.3 reactivity hazards</p> <p>.4 corrosion hazards</p> <p>.5 ignition, explosion and flammability hazards</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</p>	<p>Correctly identifies, on an MSDS, relevant hazards to the ship and to personnel, and takes the appropriate actions in accordance with established procedures</p> <p>Identification and actions on becoming aware</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>.6 sources of ignition</p> <p>.7 electrostatic hazards</p> <p>.8 toxicity hazards</p> <p>.9 vapour leaks and clouds</p> <p>.10 extremely low temperatures</p> <p>.11 pressure hazards</p> <p>.12 fuel batch differences</p> <p>Basics knowledge of hazard controls:</p> <p>.1 emptying, inerting, drying and monitoring techniques</p> <p>.2 anti-static measures</p> <p>.3 ventilation</p> <p>.4 segregation</p> <p>.5 inhibition</p> <p>.6 measures to prevent ignition, fire and explosion</p> <p>.7 atmospheric control</p> <p>.8 gas testing</p> <p>.9 protection against cryogenic damages (LNG)</p> <p>Understanding of fuel characteristics on ships subject to the IGF Code as found on a Safety Data Sheet (SDS)</p>	<p>.4 approved training programme</p>	<p>of a hazardous situation conform to established procedures in line with best practice</p>
<p>Apply occupational health and safety precautions and</p>	<p>Awareness of function of gas-measuring instruments and similar equipment</p>	<p>Examination or assessment of evidence obtained from one or more of the following:</p>	<p>Procedures and safe working practices designed to safeguard</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
measures	<p>.1 gas testing</p> <p>Proper use of safety equipment and protective devices, including:</p> <p>.1 breathing apparatus</p> <p>.2 protective clothing</p> <p>.3 resuscitators and equipment</p> <p>Basic knowledge of safe working practices and procedures in accordance with legislation and industry guidelines and personal shipboard safety relevant to ships subject to the IGF Code, including:</p> <p>.1 precautions to be taken before entering hazardous spaces and Ex zones</p> <p>.2 precautions to be taken before and during repair and maintenance work</p> <p>.3 safety measures for hot and cold work</p> <p>Basic knowledge of first aid with reference to a Safety Data Sheet (SDS)</p>	<p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training</p> <p>.4 approved training programme</p>	<p>personnel and the ship are observed at all times</p> <p>Appropriate safety and protective equipment is correctly used</p> <p>First aid do's and don'ts</p>
Carry out firefighting operations on a ship subject to the IGF Code	<p>Fire organization and action to be taken on ships subject to the IGF Code</p> <p>Special hazards associated with fuel systems and fuel handling on ships subject to the IGF Code</p>	<p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. Simulated shipboard conditions) and, whenever possible and practicable, in darkness</p>	<p>Initial actions and follow-up actions on becoming aware of an emergency conform with established practices and procedures</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Firefighting agents and methods used to control and extinguish fires in conjunction with the different fuels found on board ships subject to the IGF Code</p> <p>Firefighting system operations</p>		<p>Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures</p> <p>Clothing and equipment are appropriate to the nature of the firefighting operations</p> <p>The timing and sequence of individual actions are appropriate to the prevailing circumstances and conditions</p> <p>Extinguishment of fire is achieved using appropriate procedures techniques and firefighting agents</p>
Respond to emergencies	Basic knowledge of emergency procedures, including emergency shutdown	<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</p> <p>.4 approved training programme</p>	The type and impact of the emergency is promptly identified and the response actions conform to the emergency procedures and contingency plans

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Take precautions to prevent pollution of the environment from the release of fuels found on ships subject to the IGF Code</p>	<p>Basic knowledge of measures to be taken in the event of leakage/spillage of fuels from ships subject to the IGF Code, including the need to:</p> <ul style="list-style-type: none"> <li>.1 report relevant information to the responsible persons</li> <li>.2 awareness of shipboard spill/leakage response procedures</li> <li>.3 awareness of appropriate personal protection when responding to a spill/leakage of fuels addressed by the IGF Code</li> </ul>	<p>Examination or assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training programme</li> </ul>	<p>Procedures designed to safeguard the environment are observed at all times</p>

**Table A-V/[3-2]**

*Specification of minimum standard of competence of advanced training for ship's personnel aboard ships subject to the IGF Code*

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Familiarity with physical and chemical properties of fuels aboard ships subject to the IGF Code	<p>Basic knowledge and understanding of simple chemistry and physics and the relevant definitions related to the safe bunkering and use of fuels used on board ships subject to the IGF Code, including:</p> <p>.1 the chemical structure of different fuels used on board ships subject to the IGF Code</p> <p>.2 the properties and characteristics of fuels used on board ships subject to the IGF Code, including:</p> <p>.2.1 simple physical laws</p> <p>.2.2 states of matter</p> <p>.2.3 liquid and vapour densities</p> <p>.2.4 Boil off and weathering of cryogenic fuels</p> <p>.2.5 compression and expansion of gases</p> <p>.2.6 critical pressure and temperature of gases and pressure</p> <p>.2.7 flashpoint, upper and lower flammable limits, auto-ignition temperature</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</p> <p>.4 approved training programme</p>	<p>Effective use is made of information resources for identification of properties and characteristics of fuels addressed by the IGF Code and their impact on safety, environmental protection and ship operation</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>.2.8 saturated vapour pressure/ reference temperature</p> <p>.2.9 dewpoint and bubble point</p> <p>.2.10 hydrate formation</p> <p>.2.11 combustion properties: heating values, ,</p> <p>.2.12 methane number/knocking</p> <p>.2.13 pollutant characteristics of fuels addressed by the IGF Code</p> <p>.3 the properties of single liquids</p> <p>.4 the nature and properties of solutions</p> <p>.5 thermodynamic units</p> <p>.6 basic thermodynamic laws and diagrams</p> <p>.7 properties of materials</p> <p>.8 effect of low temperature, including brittle fracture, for liquid cryogenic fuels</p> <p>Understanding the information contained in a Safety Data Sheet (SDS) about fuels addressed by the IGF Code</p>		

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate remote controls of fuel related to propulsion plant and engineering systems and services on ships subject to the IGF Code	<p>Operating principles of marine power plants Ships' auxiliary machinery</p> <p>General knowledge of marine engineering terms</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training, where appropriate</p>	<p>Plant, auxiliary machinery and equipment is operated in accordance with technical specifications and within safe operating limits at all times</p>
Ability to safely perform and monitor all operations related to the fuels used onboard ships subject to the IGF Code	<p><i>Design and characteristics of ships subject to the IGF Code</i></p> <p>Knowledge of ship design, , systems, and equipment found on ships subject to the IGF Code, including:</p> <p>.1 fuel systems for different propulsion engines</p> <p>.2 general arrangement and construction</p> <p>.3 fuel storage systems onboard ships subject to the IGF Code, including materials of construction and insulation</p> <p>.4 fuel-handling equipment and instrumentations onboard ships:</p> <p>.4.1 fuel pumps and pumping arrangements.</p> <p>.4.2 fuel pipelines and</p> <p>.4.3 expansion devices</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</p> <p>.4 approved training programme</p>	<p>Communications are clear, understood and</p> <p>Successful vessel operations using fuels addressed by the IGF Code are carried out in a safe manner, taking into account ship designs, systems and equipment</p> <p>Pumping operations are carried out in accordance with accepted principles and procedures and are relevant to the type of fuel</p> <p>Operations are planned, risk is managed and carried out in accordance with accepted principles and procedures to ensure safety of operations and avoid pollution of the marine environment</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>.4.4 flame screens</p> <p>.4.5 temperature monitoring systems</p> <p>.4.6 fuel tank level-gauging systems</p> <p>.4.7 tank pressure monitoring and control systems</p> <p>.5 cryogenic fuel tanks temperature and pressure maintenance</p> <p>.6 fuel system atmosphere control systems (inert gas, nitrogen), including storage, generation and distribution</p> <p>.7 toxic and flammable gas -detecting systems</p> <p>.8 fuel Emergency Shut Down system (ESD)</p> <p>Knowledge of fuel system theory and characteristics, including types of fuel system pumps and their safe operation on board ships subject to the IGF Code</p> <p>.1 Low pressure pumps</p> <p>.2 High pressure pumps</p> <p>.3 Vaporizers</p> <p>.4 Heaters</p> <p>.5 Pressure Build-up Units</p>		

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Knowledge of safe procedures and checklists for taking fuel tanks in and out of service, including:</p> <ul style="list-style-type: none"> <li>.1 inerting</li> <li>.2 cooling down</li> <li>.3 initial loading</li> <li>.4 pressure control</li> <li>.5 heating of fuel</li> <li>.6 emptying systems</li> </ul>		
<p>Plan and monitor safe bunkering, stowage and securing of the fuel onboard ships subject to the IGF Code</p>	<p>General knowledge of ships subject to the IGF Code</p> <p>Ability to use all data available on board related to bunkering, storage and securing of fuels addressed by the IGF Code</p> <p>Ability to establish clear and concise communications and between the ship and the terminal, truck or the bunker- supply ship</p> <p>Knowledge of safety and emergency procedures for operation of machinery, fuel- and control systems for ships subject to the IGF Code</p> <p>Proficiency in the operation of bunkering systems on board ships subject to the IGF Code including:</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training if appropriate</li> <li>.3 approved training programme</li> <li>.4 approved laboratory equipment training or witnessing bunker operation</li> </ul>	<p>Fuel quality is determined taking into account the current conditions and necessary corrective measures safe are taken</p> <p>Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established procedures</p> <p>Operations are planned and carried out in accordance with bunkering manuals and procedures to ensure safety of operations and avoid spill damages and pollution of the environment</p>

Column 1	Column 2	Column 3	Column 4
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
	<p>.1 bunkering procedures</p> <p>.2 emergency procedures;</p> <p>.3 ship-shore/ ship-ship interface</p> <p>.4 prevention of rollover</p> <p>Proficiency to perform fuel-system measurements and calculations, including:</p> <p>.1 Maximum fill quantity</p> <p>.2 On Board Quantity (OBQ)</p> <p>.3 Minimum Remain On Board (ROB)</p> <p>.4 fuel consumption calculations</p>		<p>Personnel are allocated duties and informed of procedures and standards of work to be followed, in a manner appropriate to the individuals concerned and in accordance with safe working procedures</p> <p>Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established procedures</p>
Take precautions to prevent pollution of the environment from the release of fuels from ships subject to the IGF Code	<p>Knowledge of the effects of pollution on human and environment</p> <p>Knowledge of measures to be taken in the event of spillage/leakage, including the need to:</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training</p> <p>.4 approved training programme</p>	<p>Procedures designed to safeguard the environment are observed at all times</p>
Monitor and control compliance with legislative requirements	<p>Knowledge and understanding of relevant provisions of the International Convention for the Prevention of</p>	<p>Assessment of evidence obtained from one or more of the following:</p>	<p>The handling of as fuels onboard ships subject to the IGF Code complies with relevant IMO</p>

Column 1	Column 2	Column 3	Column 4
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
	<p>Pollution from Ships (MARPOL) and other relevant IMO instruments, industry guidelines and port regulations as commonly applied</p> <p>Proficiency in the use of the IGF Code and related documents</p>	<p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training</p> <p>.4 approved training</p>	<p>instruments and established industrial standards and codes of safe working practices</p> <p>Bunkering operations are planned and performed in conformity with approved procedures and legislative requirements</p>
<p>Take precautions to prevent hazards</p>	<p>Knowledge and understanding of the hazards and control measures associated with fuel system operations on board ships subject to the IGF Code, including:</p> <p>.1 flammability</p> <p>.2 explosion</p> <p>.3 toxicity</p> <p>.4 reactivity</p> <p>.5 corrosivity</p> <p>.6 health hazards</p> <p>.7 inert gas composition</p> <p>.8 electrostatic hazards</p> <p>.9 pressurized gases</p> <p>Proficiency to calibrate and use monitoring and fuel detection systems, instruments and</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training</p> <p>.4 approved training programme</p>	<p>Relevant hazards to the ship and to personnel associated with operations onboard ships subject to the IGF Code are correctly identified and proper control measures are taken</p> <p>Use of flammable and toxic gas-detection devices are in accordance with manuals and good practice</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>equipment onboard ships subject to the IGF Code</p> <p>Knowledge and understanding of dangers of non-compliance with relevant rules/regulations</p> <p>Knowledge and understanding of risks assessment method analysis on board ships subject to the IGF Code</p> <p>Ability to elaborate and develop risks analysis related to risks on board ships subject to the IGF Code</p> <p>Ability to elaborate and develop safety plan and safety instructions for ships subject to the IGF Code</p>		
<p>Application of leadership and teamworking skills on board a ship subject to the IGF Code</p>	<p>Ability to apply task and workload management, including:</p> <p>.1 planning and coordination</p> <p>.2 personnel assignment</p> <p>.3 time and resource constraints</p> <p>.4 prioritization</p> <p>.5 allocation, assignment and prioritization of resources</p> <p>.6 effective communication on board and ashore</p> <p>Ability to ensure the safe management of</p>	<p>Examination and assessment of evidence obtained from one or more of the following :</p> <p>.1 approved in-service</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training</p> <p>.4 approved training programme</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>. Decisions are most effective for the situation</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>bunkering and other IGF Code fuel related operations concurrent with other onboard operations, both in port and at sea</p>		
<p>Apply occupational health and safety precautions and measures on board a ship subject to the IGF Code</p>	<p>Proper use of safety equipment and protective devices, including:</p> <ul style="list-style-type: none"> <li>.1 breathing apparatus and evacuating equipment</li> <li>.2 protective clothing and equipment</li> <li>.3 resuscitators</li> <li>.4 rescue and escape equipment</li> </ul> <p>Knowledge of safe working practices and procedures in accordance with legislation and industry guidelines and personal shipboard safety including:</p> <ul style="list-style-type: none"> <li>.1 precautions to be taken before, during and after repair and maintenance work on fuel systems addressed in the IGF Code</li> <li>.2 electrical safety (ref to IEC 600079-17)</li> <li>.3 ship/shore safety checklist</li> </ul> <p>Basic knowledge of first aid with reference to a Safety Data Sheets (SDS) for fuels addressed by the IGF Code</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Appropriate safety and protective equipment is correctly used</p> <p>Procedures designed to safeguard personnel and the ship are observed at all times</p> <p>Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns</p> <p>First aid do's and don'ts</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Prevent, control and fight fires onboard ships subject to the IGF Code	Methods and firefighting appliances to detect, control and extinguish fires of fuels addressed by the IGF Code	Assessment of evidence obtained from approved firefighting training	<p>The type and scale of the problem is promptly identified, and initial actions conform with the emergency procedures for fuels addressed by the IGF Code</p> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the fuels addressed by the IGF Code</p>
Develop emergency and damage control plans and handle emergency situations onboard ships subject to the IGF Code	<p>Ship construction, including damage control</p> <p>Knowledge and understanding of shipboard emergency procedures for ships subject to the IGF Code, including:</p> <p>.1 ship emergency response plans</p> <p>.2 emergency shutdown procedure</p> <p>.3 actions to be taken in the event of failure of systems or services essential to fuel-related operations</p> <p>.4 enclosed space rescue</p> <p>.5 emergency fuel system operations</p> <p>Action to be taken following collision, grounding or spillage and envelopment of the ship</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</p> <p>.4 approved training programme</p>	<p>The type and impact of emergency is promptly identified, and the response actions conform with established emergency procedures and contingency plans</p> <p>The order of priority and the levels and timescales 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>Evacuation, emergency shutdown and isolation are appropriate to the nature of the emergency and implemented promptly</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>in toxic or flammable vapour including:</p> <p>.1 measures to keep tanks safe and emergency shutdown to avoid ignition of flammable mixtures and to avoid rapid phase transition (RPT)</p> <p>.2 initial assessment of damage and damage control</p> <p>.3 safe manoeuvre of the ship</p> <p>.4 precautions for the protection and safety of passengers and crew in emergency situations including evacuation to safe areas</p> <p>.5 controlled jettisoning of fuel</p> <p>Actions to be taken following envelopment of the ship in flammable fluid or vapour</p> <p>Knowledge of medical first-aid procedures and antidotes on board ships using fuels addressed by the IGF Code reference to the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG)</p>		<p>Initial actions and, if appropriate, manoeuvring are in accordance with contingency plans and are appropriate to the urgency of the situation and the nature of the emergency</p> <p>Decisions and measures taken:</p> <p>.1 reduce to the minimum the consequences of any default in the operating systems of the ship</p> <p>.2 reinforce to the maximum level the safety of persons on board</p> <p>Communications are efficient and are in conformity with accepted procedures</p> <p>The identification of and actions taken in a medical emergency conform to current recognized first aid practice and international guidelines</p>

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## ANNEX 3

### DRAFT AMENDMENT TO PART B OF THE STCW CODE

*Insert new section B-V/[3] after existing section B-V/2:*

"Section B-V/[3]

*Guidance regarding the training and qualifications of masters, officers, ratings and other personnel on ships subject to the IGF Code*

1 The Administration may, in respect of ships of less than 500 gross tonnage, except for passenger ships, if it considers that a ship's size and the length or character of its voyage are such as to render the application of the full requirements of this section unreasonable or impracticable, exempt the seafarers on such a ship or class of ships from some of the requirements, bearing in mind the safety of people on board, the ship and property and the protection of the marine environment.

2 Emergency exercises on board ships using gas as fuel should be conducted at regular intervals. The response and safety system for hazard and accident control shall be reviewed and tested.

#### PERSON WITH IMMEDIATE RESPONSIBILITY

3 The term "person with immediate responsibility" as used in paragraphs 6 and 7 of regulation V/[3] means a person being in a decision-making capacity with respect to loading, discharging, care in transit, handling of fuels addressed by the IGF Code, tank cleaning or other fuel-related operations.

#### PROOF OF QUALIFICATION

4 The master of every ship subject to the IGF Code should ensure that the officer or the person with immediate responsible for the fuel on board possesses the appropriate certificate, issued or endorsed or validated as required by regulation V/[3], paragraph 6 and has had adequate recent practical experience on board an appropriate type of ship to permit that officer or person to safely perform the duties assigned. Seafarers trained and certified according to the requirements of section A-V/1-2 -1 or section A-V/1-2-2 should be considered to be appropriately qualified, provided that:

- 4.1 they have completed seagoing service of at least 24 months on board a tanker carrying the fuel concerned as cargo; and
- 4.2 they have received ship and equipment specific familiarization on the particular features of ships using gas as fuel, including bunkering operations.

#### GUIDANCE REGARDING APPROVED ONBOARD TRAINING

5 The purpose of qualifying shipboard service is to provide training and knowledge for the safe use of fuels addressed by the IGF Code.

6 To satisfy the experience appropriate to their duties on the ship on which they serve as referred to in regulation V/[3], onboard training should:

- .1 emphasize practical "hands on experience" and be related to the employment of the seafarer, i.e. the training of deck and engineering departments may be different;
- .2 be under the supervision of personnel qualified and experienced in the handling, characteristics and safety procedures of the fuels being used by the ship;
- .3 be on board the ship carrying fuels relative to the Certificate of Proficiency/Endorsement being sought and should be such that the specialized equipment is brought into operation for the use of the fuels addressed by the IGF Code; and
- . 4 take part in at least three bunkering operations.<sup>1</sup>

7 The onboard training programme must in no way affect the safe running or the seaworthiness of the ship.

### **ONBOARD TRAINING PROGRAMME**

8 The trainee should be carried in a supernumerary capacity (i.e. the trainee will have no other duties than that of undertaking the training programme and emergency duties).

9 The programme of onboard training should be managed and coordinated by the company which manages the ship on which the seagoing service is to be performed and be a ship nominated by the company as a training ship.<sup>2</sup>

10 At all times, the trainee should be aware of two identifiable individuals who are immediately responsible for the management of the programme of onboard training. The first of these is a qualified seagoing officer, referred to as the "shipboard training officer", who, under the authority of the master, should organize and supervise the programme of training. The second should be a person nominated by the company, referred to as the "company training officer", who should have an overall responsibility for the training programme and for coordination with training organizations.

11 The trainee should be provided with an approved training record book approved by the Administration to enable a comprehensive record of practical training and experience at sea to be maintained. The approved training record book should be laid out in such a way that it can provide detailed information about the tasks and duties which should be undertaken and the progress towards their completion. Duly completed and countersigned by the master, the approved record book will provide unique evidence that a structured programme of onboard training has been completed leading towards the issue of a relevant Certificate of Proficiency for operations with the fuels addressed by the IGF Code.

12 During the approved, onboard training programme the trainee should be instructed in the loading, discharging, care in transit, handling of fuels, tank cleaning or other fuel-related operations of the ship to ensure that the experience gained is at least equal to that which would be obtained in three months' normal service.

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<sup>1</sup> A bunkering operation is considered to be the loading of more than 60% of the total fuel tank capacity of the vessel. Bunkering of less than this quantity may be summed together to be equivalent to this quantity.

<sup>2</sup> A nominated training ship is a trading ship named by the company that is suitable for the purpose of this guidance, as applicable.

13 If the three-loading criteria cannot be achieved within the one-month onboard training period, then the period of onboard training should be extended until these criteria have been satisfactorily achieved.

14 As much use as possible should be made of shipboard operation and equipment manuals, films and suitable visual aids, and the opportunity should be taken to introduce discussion of the part to be played by the safety organization on board ship and the role of safety officers and safety committees.

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## ANNEX 4

### DRAFT INTERIM GUIDANCE ON TRAINING FOR SEAFARERS ON SHIPS USING GASES OR OTHER LOW-FLASHPOINT FUELS

All seafarers employed on ships within the scope of the IGF Code should receive appropriate training on the risks and emergency procedures associated with fuels addressed by the IGF Code, in accordance with their duties and responsibilities. On that basis, the following three training levels have been identified:

- .1 general familiarization training for all seafarers;
- .2 basic training for seafarers responsible for designated safety duties; and
- .3 advanced training for the master, engineering engineer officers and any person with immediate responsibility for the care of fuels addressed by the IGF Code.

In addition, engineer officers and any person with immediate responsible for the bunkering and use of fuels addressed by the IGF Code should receive ship and equipment specific familiarization.

#### TRAINING REQUIREMENTS

##### 1 General

1.1 Prior to being assigned duties on board a ship using fuels addressed by the IGF Code, all seafarers should receive appropriate training in accordance with this section.

1.2 The Administration may, in respect of ships of less than 500 gross tonnage, except for passenger ships, if it considers that a ship's size and the length or character of its voyage are such as to render the application of the full requirements of this section unreasonable or impracticable, exempt the seafarers on such a ship or class of ships from some of the requirements, bearing in mind the safety of people on board, the ship and property and the protection of the marine environment.

1.3 All seafarers serving on board a ship using fuels addressed by the IGF Code should receive familiarization training in accordance with paragraph 2.1 and should meet the standard of competence specified therein.

1.4 Seafarers employed or engaged in any capacity on board a ship using fuels addressed by the IGF Code on the business of that ship as part of the ship's complement with designated safety duties in the operation of the ship should receive basic training or instruction in accordance with paragraph 2.2 and should meet the standard of competence specified therein.

1.5 Masters, engineer officers and any person with immediate responsibility for the care and use of fuels addressed by the IGF Code on board ships should receive advanced training in accordance with paragraph 2.3 and should meet the standard of competence specified therein.

1.6 Engineer officers and any person participating in bunkering operations on board ships using fuels addressed by the IGF Code should receive ship and equipment specific familiarization in accordance with paragraph 2.4 and should meet the standard of competence specified therein.

1.7 Familiarization, basic, and advanced training should be given by qualified personnel experienced in the handling and characteristics of the fuels used and the safety procedures involved.

1.8 Seafarers qualified in advanced training should be required, every five years, to provide evidence of having maintained the required standard of competence to undertake their duties and responsibilities.

1.9 It is important to emphasize the need to take account of risk analyses. All risk analyses carried out should be made available to participants during training.

## **2 STANDARDS OF COMPETENCE**

### **2.1 Standard of competence for general familiarization training**

2.1.1 Before being assigned to shipboard duties, all seafarers on board a ship using fuels addressed by the IGF Code, other than passengers, should receive familiarization training to be able to:

- .1 communicate with other persons on board on elementary safety matters relating to the hazards associated with the fuel;
- .2 take precautions to prevent fuel-related hazards;
- .3 know the procedures to follow in the event of a fuel-related emergency; and
- .4 take part in fuel-related emergency and contingency procedures.

2.1.2 Holders of any certificate of basic or advanced training on liquefied gas tanker cargo operations should be considered to meet these requirements on board ships using liquefied gas as fuel.

### **2.2 Standard of competence for basic training**

2.2.1 Seafarers employed or engaged in any capacity on board a ship using fuels addressed by the IGF Code on the business of that ship as part of the ship's complement with designated safety duties in the operation of the ship should, before being assigned to shipboard duties:

- 2.2.1.1 receive basic training or instruction as determined by the Administration on the use of fuel so as to:
  - 2.2.1.1.1 contribute to the safe operation of ships using fuels addressed by the IGF Code;
  - 2.2.1.1.2 take precautions to prevent fuel-related hazards;
  - 2.2.1.1.3 carry out firefighting operations on board ships using fuels addressed by the IGF Code; and
  - 2.2.1.1.4 respond to emergencies on board ships using fuels addressed by the IGF Code; and

2.2.1.2 be required to provide evidence of having achieved the required standard of competence to undertake their duties and responsibilities through:

2.2.1.2.1 demonstration of competence in accordance with the methods and criteria for evaluating competence determined by the Administration; and

2.2.1.2.2 examination or continuous assessment as part of a training programme determined by the Administration.

2.2.2 A document should be issued indicating that the holder has attended the basic training required under the IGF Code; the document should specify the fuel or family of fuels covered by the training.

2.2.3 Holders of any certificate of basic or advanced training on liquefied gas tanker cargo operations should be considered to meet the standard of competence set out in this subsection for the performance of duties on board ships using liquefied gas as fuel if they have met the requirements of section 3 of this guidance.

### 2.3 Standard of competence for advanced training

2.3.1 Masters, engineer officers and any person with immediate responsibility for the care and use of fuels addressed by the IGF Code serving on board ships using fuels addressed by the IGF Code should, before being assigned to shipboard duties:

2.3.1.1 receive advanced training as determined by the Administration on the use of fuels addressed by the IGF Code so as to:

2.3.1.1.1 be familiar with the physical and chemical properties of the fuels used;

2.3.1.1.2 operate the remote controls of the propulsion plant and engineering systems involving the fuels used;

2.3.1.1.3 be able to safely perform and monitor all operations involving the fuel used;

2.3.1.1.4 plan and ensure safe operations for bunkering and shipboard storage of the fuel used;

2.3.1.1.5 take precautions to prevent pollution of the environment from the release of the fuels used;

2.3.1.1.6 monitor and control compliance with legislative requirements;

2.3.1.1.7 take precautions to prevent fuel-related hazards;

2.3.1.1.8 use skill in the management of a ship using fuels addressed by the IGF Code;

2.3.1.1.9 apply occupational health and safety precautions and measures on board ships using fuels addressed by the IGF Code;

- 2.3.1.1.10 prevent, control and fight fires on board ships using fuels addressed by the IGF Code; and
- 2.3.1.1.11 develop emergency and damage control plans and handle emergency situations on board ships using fuels addressed by the IGF Code; and
- 2.3.1.2 be required to provide evidence of having achieved the required standard of competence to undertake their duties and responsibilities through:
  - 3.1.2.1 demonstration of competence in accordance with the methods and criteria for evaluating competence determined by the Administration; and
  - 3.1.2.2 examination or continuous assessment as part of a training programme determined by the Administration.
- 2.3.1 A document should be issued by the Administration indicating that the holder has attended the advanced training required under the IGF Code; the document should specify the fuel or family of fuels covered by the training.
- 2.3.2 Holders of any certificate of advanced training on liquefied gas tanker cargo operations and have completed seagoing service of at least 24 months on board a tanker carrying the fuel concerned as cargo should be considered to meet the standard of competence set out in this subsection for the performance of duties on board ships using liquefied gas as fuel, provided that they have received additional familiarization training on the particular features of ships using gas as fuel, including with regard to bunkering operations.

### **3 SHIP AND EQUIPMENT SPECIFIC FAMILIARIZATION**

- 3.1 Engineer officers and any person having immediate responsibility for fuels on board ships using fuels addressed by the IGF Code should, before being assigned to shipboard duties:
  - 3.1.1 receive ship and equipment specific familiarization as based upon the ship's fuel transfer manual on the use of fuels addressed by the IGF Code so as to:
    - 3.1.1.1 maintain a safe engineering watch;
    - 3.1.1.2 deal with operational incidents;
    - 3.1.1.3 operate emergency equipment and apply emergency procedures;
    - 3.1.1.4 contribute to operations for bunkering and transfer of the fuels used;
    - 3.1.1.5 operate main and auxiliary machinery and associated control systems;



- 3.1.1.6 apply occupational health and safety precautions on board ships using fuels addressed by the IGF Code;
- 3.1.1.7 maintain and repair electrical and electronic equipment in gas installations; and
- 3.1.1.8 maintain and repair shipboard machinery and equipment; and
- 3.1.2 be required to provide evidence of having achieved the required standard of competence to undertake their duties and responsibilities through:
  - 3.1.2.1 demonstration of competence in accordance with the methods and criteria for evaluating competence approved by the Administration; and
  - 3.1.2.2 examination or continuous assessment as part of a training programme approved by the Administration.

3.2 The Company, consistent with STCW Code A-I/14, shall provide documentary evidence attesting to the holder of having completed the ship and equipment specific familiarization regarding the handling of the fuel or family of fuels used on board its ship subject to the IGF Code.

3.3 Holders of any certificate of advanced training on liquefied gas tanker cargo operations should be considered to meet the standard of competence set out in this subsection for the performance of duties on board ships using liquefied gas as fuel, provided that:

- 3.3.1 they have completed seagoing service of at least 24 months on board a tanker carrying the fuel concerned as cargo; and
- 3.3.2 they have received ship and equipment specific familiarization on the particular features of ships using gas as fuel, including with regard to bunkering operations.

#### **4 EMERGENCY EXERCISES AND TRAINING**

4.1 Emergency exercises on board ships using gas as fuel should be conducted at regular intervals. The response and safety system for hazard and accident control should be reviewed and tested."

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