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CG-MMC Policy Letter
No. 01-21

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From: M. Medina
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To: National Maritime Center

Subj: GUIDELINES FOR OBTAINING STCW ENDORSEMENTS FOR BASIC AND ADVANCED IGF CODE OPERATIONS

Ref:
(a) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention)
(b) International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code)
(c) CG-MMC Policy Letter 02-19, *Guidelines for Training of Personnel on Vessels Using Natural Gas and Other Low Flashpoint Fuels*
(d) Seafarers' Training, Certification and Watchkeeping Code, as amended (STCW Code)
(e) CG-OES Policy Letter 01-15, *Guidelines for Liquefied Natural Gas Fuel Transfer Operations and Training of Personnel on Vessels Using Natural Gas as Fuel,* Enclosure (3), Excerpts from the STCW Convention and the STCW Code
(f) 46 CFR 15.405 – Familiarity with vessel characteristics
(g) 46 CFR 15.1105 – Familiarization and basic training
(h) 46 CFR 10.402 – Approval of training courses
(i) International Electrotechnical Commission (IEC) Standard 60079-17

1. PURPOSE. This policy letter provides guidance for qualifying personnel for the issuance of Merchant Mariner Credential (MMC) endorsements in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention), for service on vessels subject to the International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code).

2. ACTION. The Coast Guard's National Maritime Center (NMC) will use this policy to evaluate applications for STCW endorsements for Basic and Advanced IGF Code Operations.

3. DIRECTIVES AFFECTED. This policy letter supersedes CG-MMC Policy Letter 02-19, *Guidelines for Training of Personnel on Vessels Using Natural Gas and Other Low Flashpoint Fuels*. CG-MMC Policy Letter 02-19 is hereby cancelled.

4. BACKGROUND.

   a. Natural gas and other low flashpoint fuels are considered by the maritime industry to be a prominent future fuel source for commercial vessels. Vessels that use natural gas and other low flashpoint fuels are subject to unique and complex equipment and operations.

These fuels tend to be volatile and potentially dangerous due to the specialized temperature and pressure requirements of using them. Improper handling of natural gas and other low flashpoint fuels can cause an explosion leading to loss of life, as well as damage to cargo and vessels. Mariners engaged on these vessels need to receive training on the risks and emergency procedures associated with the use of gases or other low flashpoint fuels as appropriate to safely and effectively fulfill their duties and responsibilities.

b. The International Maritime Organization (IMO) developed the IGF Code to address the safety and environmental risks associated with using natural gas and other low flashpoint fuels. The IGF Code was adopted by the IMO in June 2015, and it includes a requirement for training of personnel engaged on vessels using gases or other low flashpoint fuels.

c. The STCW Convention and the Seafarers' Training, Certification and Watchkeeping Code, as amended (STCW Code) were amended to incorporate the training requirements supporting the implementation of the IGF Code. These amendments provide minimum standards of competence, sea service, and training, at the basic and advanced levels, for personnel serving on vessels subject to the IGF Code certification. The requirements of the IGF Code and the supporting amendments to the STCW Convention and STCW Code entered into force on January 1, 2017.

5. DISCUSSION.

a. The amendments to the STCW Convention and the STCW Code include sea service, recency, and training, as well as minimum standards of competence for mariners at the basic and advanced levels in IGF Code Operations.

b. STCW endorsements for IGF Code Operations are not mandated by Coast Guard regulation. However, if United States mariners do not hold appropriate STCW endorsements for IGF Code Operations, there is a risk that U.S. vessels subject to the IGF Code will be detained in foreign ports and that U.S. mariners would be ineligible to serve on foreign-flagged ships.

c. The Coast Guard will issue IGF Code Operations endorsements to mariners who have voluntarily fulfilled the STCW requirements and request the endorsement.

d. Guidance for obtaining an STCW endorsement for Basic IGF Code Operations is provided in Enclosure (1), Qualification for STCW Endorsements for Basic IGF Code Operations. Guidance for obtaining an STCW endorsement for Advanced IGF Code Operations is provided in Enclosure (2), Qualification for STCW Endorsements for Advanced IGF Code Operations.

e. The NMC will process applications for STCW endorsements for Basic and Advanced IGF Code Operations. Applications for IGF Code Operations endorsements should be submitted in accordance with the requirements described in Enclosures (1) and (2). The NMC will not issue national endorsements for IGF Code Operations.

f. The NMC will evaluate and approve courses in accordance with this guidance. Coast Guard-approved courses should include both the training and competence requirements for the endorsements. Training providers who had courses evaluated by the NMC under CG-OES Policy Letter 01-15 or CG-MMC Policy Letter 02-19, and who received a letter attesting that the course content meets the requirements of the STCW amendments, do not need to resubmit courses for a new approval. The NMC will re-issue existing course review letters as course approvals with the same expiration date as the letters, in accordance with 46 CFR 10.402.

g. Training may be combined into a single course meeting endorsement requirements for Basic IGF Code Operations and Advanced IGF Code Operations. A combined course should include evidence of how the required standards of competence are met in accordance with the methods and criteria for evaluating competence in Enclosure (3) of this policy letter, STCW Code Tables A-V/3-1 and A-V/3-2.

h. The standards of competence for endorsements for IGF Code Operations in Enclosure (3) include knowledge, understanding, and proficiencies (KUPs) associated with firefighting. Mariners will be considered to have met these KUPs if they have previously completed approved training for basic firefighting and have a currently valid endorsement for STCW Basic Training. The approved or accepted training for Basic and Advanced IGF Code Operations specified in Enclosures (1) and (2) does not need to include training for firefighting.

i. The Coast Guard will not be issuing national endorsements for fueling operations on vessels using natural gas or other low flashpoint fuels that are not subject to the IGF Code.

6. DISTRIBUTION. No paper distribution will be made of this policy letter. An electronic version will be located at https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/National-Maritime-Center-NMC/policy_regulations/.

7. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it, in itself, a regulation. It is not intended to nor does it impose legally-binding requirements on any party. This guidance represents the Coast Guard's current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other Federal and State regulators, in applying statutory and regulatory requirements. No U.S. law requires any mariner to obtain the endorsements described in this policy letter. Alternative approaches for fulfilling the STCW requirements may be acceptable if the approach satisfies the applicable requirements.

8. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.

a. The development of this guidance and the general policies contained within it have been thoroughly reviewed under Department of Homeland Security Directive 023-01, Rev.1,

associated implementing instructions, and Environmental Planning COMDTINST 5090.1 (series), which guide the Coast Guard in complying with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4370f) by the originating office, which has determined that this action is one of a category of actions that do not individually or cumulatively have a significant effect on the human environment.[1]

b. This policy letter is categorically excluded under paragraph A3 of Appendix A, of Table 1 of DHS Directive Instruction Manual 023-01, Rev. 1. Paragraph A3 pertains to the promulgation of rules, issuance of rulings or interpretations, and the development of and publication of policies, orders, directives, notices, procedures, manuals, advisory circulars, and other guidance documents of the following nature: (a) Those of a strictly administrative or procedural nature; (b) those that implement, without substantive change statutory or regulatory requirements; (c) those that implement, without substantive change, procedures, manuals and other guidance documents; (d) those that interpret or amend an existing regulation without changing its environmental effect; (e) technical guidance on safety or security matters; or (f) guidance for the preparation of security plans. This policy letter provides guidance for the qualification of personnel for the issuance of MMC endorsements in accordance with the STCW for service on vessels subject to the IGF Code. This action is consistent with our categorical exclusion at paragraph A3 of the DHS Instruction.

c. This guidance will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this guidance must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates.

9. QUESTIONS. Questions or concerns regarding implementation of this policy letter and/or requests for changes should be directed to the Office of Merchant Mariner Credentialing (CG-MMC) at (202) 372-2357 or MMCPolicy@uscg.mil.

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Encl: (1) Qualification for STCW Endorsements for Basic IGF Code Operations
(2) Qualification for STCW Endorsements for Advanced IGF Code Operations
(3) Excerpts from the STCW Convention and the STCW Code

[1] A Memorandum for the Record supporting this determination is available in an online docket at *https://www.regulations.gov*, under USCG-2020-0181.

QUALIFICATION FOR STCW ENDORSEMENTS FOR BASIC IGF CODE OPERATIONS

1. General. This enclosure provides guidance to mariners regarding qualification for an STCW endorsement for Basic IGF Code Operations. The Coast Guard will issue this endorsement to mariners who have voluntarily fulfilled the STCW requirements contained in this enclosure and request the endorsement.

2. Qualification.

   a. To qualify for an STCW endorsement for Basic IGF Code Operations, mariners must meet one of the following:

      1) Hold an STCW endorsement for Advanced Liquefied Gas Tanker Cargo Operations (46 CFR 13.607) or Basic Liquefied Gas Tanker Cargo Operations (46 CFR 13.611); or

      2) Provide evidence of having satisfactorily completed approved or accepted training in Basic IGF Code Operations, and provide evidence of meeting the standard of competence specified in Table A-V/3-1 of the STCW Code (Enclosure (3)).

   b. The standard of competence in STCW Code Table A-V/3-1 includes knowledge, understanding, and proficiencies (KUPs) associated with firefighting. Mariners will be considered to have met these KUPs if they have previously completed approved training for basic firefighting and have a currently valid endorsement for STCW Basic Training (BT). The approved or accepted training specified in paragraph 2, subparagraph a (2) above does not need to include training for firefighting.

   c. Qualified applicants will have their MMC endorsed with STCW Regulation V/3-1 and a capacity for Basic IGF Code Operations. Endorsements will be issued for a period that coincides with the validity period of the MMC as per 46 CFR 10.231(b) unless the mariner submits an application for a renewal in accordance with 46 CFR 10.227.

   d. Mariners may qualify for an endorsement for Basic IGF Code Operations without any corresponding national endorsement.

   e. Mariners who hold a valid MMC with an STCW endorsement that required completion of or continued competency for Basic Training will be issued the endorsement for Basic IGF Code Operations by meeting only the guidance in paragraph 2, subparagraph a (2) above.

3. Renewal of Endorsements. To renew an STCW endorsement for Basic IGF Code Operations, a mariner must meet the applicable requirements in 46 CFR 10.227 to renew their national endorsement and provide evidence of maintaining the following standards of competence:

   a. Basic Training as specified in 46 CFR 11.302(b) and 46 CFR 12.602(b); and

   b. Basic IGF Code Operations by either:

      1) Successful completion within the previous 5 years of approved or accepted refresher training for Basic IGF Code Operations; or

      2) One year of seagoing service within the previous 5 years on any vessel subject to the IGF Code.

4. Transitional Provisions. The Coast Guard will accept training that was evaluated by the NMC under CG-OES Policy Letter 01-15 or CG-MMC Policy Letter 02-19 as meeting the Basic IGF Code Operations training requirement in paragraph 2, subparagraph a (2). above if the training provider was issued a letter attesting that the course content meets the requirements of the STCW.

QUALIFICATION FOR STCW ENDORSEMENTS FOR ADVANCED IGF CODE OPERATIONS

1. General. This enclosure provides guidance to mariners regarding qualification for an STCW endorsement for Advanced IGF Code Operations. The Coast Guard will issue this endorsement to mariners who have voluntarily fulfilled the STCW requirements contained in this enclosure and request the endorsement.

2. Qualification. To qualify for an STCW endorsement for Advanced IGF Code Operations mariners must meet the following requirements:

   a. Provide evidence of satisfactory completion of approved or accepted training in Advanced IGF Code Operations that meets the standard of competence specified in Table A-V/3-2 of the STCW Code (Enclosure (3)); and

   b. Provide evidence of either:

      1) While holding an STCW endorsement for Basic IGF Code Operations, as specified in Enclosure (1) of this policy letter, provide evidence of one month of seagoing service that includes a minimum of three fuel transfers on board vessels subject to the IGF Code. Two of the three fuel transfers may be replaced by approved or accepted simulator training. Fuel transfers should be documented as described in paragraph 5 of this enclosure; or

      2) While holding an STCW endorsement for Advanced Liquefied Gas Tanker Cargo Operations (46 CFR 13.607) or Basic Liquefied Gas Tanker Cargo Operations (46 CFR 13.611), without limitation to non-self-propelled vessels or to maintenance and repair of cargo equipment (46 CFR 13.607(a)), provide evidence of meeting both of the following paragraphs:

         A. Three months of seagoing service within the previous 5 years on board a liquefied gas tanker, vessels subject to the IGF Code, or vessels using gases or low flashpoint fuels; and

         B. Completion of a minimum of three fuel transfers on board vessels subject to the IGF Code, or of having participated in three cargo transfers on board a liquefied gas tanker. Fuel transfers should be documented as described in paragraph 5 of this enclosure. Cargo transfers should be documented as specified in 46 CFR 13.127(a)(4).

   c. The standard of competence in STCW Code Table A-V/3-2 (Enclosure (3)) includes knowledge, understanding, and proficiencies (KUPs) associated with firefighting. Mariners will be considered to have met these KUPs if they have previously completed approved training for basic firefighting and have a currently valid endorsement for STCW Basic Training (BT). The approved or accepted training specified in paragraph 2, subparagraph a. above does not need to include training for firefighting.

   d. Qualified Applicants will have their MMC endorsed with STCW Regulation V/3-2 and a capacity of Advanced IGF Code Operations. Endorsements will be issued for a period that coincides with the validity period of the MMC as per 46 CFR 10.231(b) unless the mariner submits an application for a renewal in accordance with 46 CFR 10.227.

   e. Mariners may qualify for an endorsement for Advanced IGF Code Operations without any corresponding national endorsement.

f. Mariners who hold a valid MMC with an STCW endorsement that required completion of or continued competency for Basic Training will be issued the endorsement for Advance IGF Code Operations by meeting only the guidance in paragraph 2(a) and 2(b) above.

3. Renewal of Endorsements. To renew an STCW endorsement for Advanced IGF Code Operations, mariners must meet the applicable requirements in 46 CFR 10.227 to renew their national endorsement and provide evidence of maintaining the following standards of competence:

   a. Basic Training as specified in 46 CFR 11.302(b) and 12.602(b); and

   b. Advanced IGF Code Operations by one of the following:

      1) Satisfactory completion within the previous 5 years of approved or accepted refresher training in Advanced IGF Code Operations; or

      2) One year of seagoing service within the previous 5 years on vessels subject to the IGF Code.

4. Transitional Provisions. The Coast Guard will accept training that was evaluated by the NMC under CG-OES Policy Letter 01-15 or CG-MMC Policy Letter 02-19 as meeting the Advanced IGF Code Operations training requirement in paragraph 2, subparagraph a. above if the training provider was issued a letter attesting to the course content meeting the requirements of the STCW.

5. Fuel Transfers. Documentation of gases or low flashpoint fuel transfers (cargo transfers are not acceptable) must be signed by the owner, operator, master, or chief engineer of the vessel and must specify the following:

   a. The name of the vessel, official number for the vessel, and date of service for each vessel;

   b. The dates and the number of fuel transfers the applicant participated in, and the ports or terminals, if applicable;

   c. Verification that the applicant has demonstrated to the satisfaction of the signer that they are fully capable of taking immediate responsibility for the care and use of fuels and the onboard fuel systems and supervising transfers of fuel, including:

      1) Pre-transfer inspection;
      2) Pre-transfer conference and execution of the Declaration of Inspection;
      3) Connection of hoses or loading-arms;
      4) Line-up of the piping system for loading and transfer of fuel;
      5) Start of liquid flow during loading;
      6) Calculation of loading rates;
      7) Monitoring;
      8) Topping-off of tanks during loading;
      9) Disconnection of the hoses or loading arms; and

10) Securing of fuel systems.

d. In determining the number of fuel transfers that the applicant has participated in, the following rules apply:

1) A fuel transfer must involve loading to at least one of the vessel's fuel tanks from a shore facility or another vessel. A shift of fuel from one tank to another tank on the same vessel is not a transfer for this purpose; and

2) Regardless of how long the fuel transfer lasts beyond 4 hours, or how many tanks are loaded, credit may only be received for one fuel transfer conducted during each watch.

AMENDMENTS TO THE STCW CONVENTION AND CODE DEFINING THE MINIMUM STANDARDS OF COMPETENCE IN BASIC AND ADVANCED TRAINING FOR SHIPS SUBJECT TO THE IGF CODE[2]

AMENDMENTS TO THE STCW CONVENTION

Chapter V

Special training requirements for personnel on certain types of ships

Regulation V/3

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

1 This regulation applies to masters, officers, ratings and other personnel serving on board ships subject to the IGF Code.

2 Prior to being shipboard duties on board ships subject to the IGF code, seafarers shall have completed the training required by paragraphs 4 to 9 below in accordance with their capacity, duties and responsibilities.

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, paragraph 1.5.

4 Seafarers responsible for designated safety duties associated with the care, use or in emergency response to the fuel on board ships subject to the IGF Code shall hold a certificate in basic training for service on ships subject to the IGF Code.

5 Every candidate for a certificate in basic training for service on ships subject to the IGF Code shall have completed basic training in accordance with section A-V/3, paragraph 1 of the STCW Code.

6 Seafarers responsible for designated safety duties associated with the care, use or in emergency response to the fuel on board ships subject to the IGF Code who have been qualified and certified according to regulation V/1-2, paragraphs 2 and 5, or regulation V/1-2, paragraphs 4 and 5 on liquefied gas tankers, are to be considered as having met the requirements specified in Section A-V/3, paragraph 1 for basic training for service on ships subject to the IGF Code.

7 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 hold a certificate in advanced training for service on ships subject to the IGF Code.

8 Every candidate for a certificate in advanced training for service on ships subject to the IGF Code shall, while holding the Certificate of Proficiency described in paragraph 4, have:

.1 completed approved advanced training for service on ships subject to the IGF Code and meet the standard of competence as specified in section A-V/3, paragraph 2 of the STCW Code; and

.2 completed at least one month of approved seagoing service that includes a minimum of three bunkering operations on board ships subject to the IGF Code. Two of the three bunkering operations may be replaced by approved simulator training on bunkering operations as part of the training in paragraph 8.1 above.

9 Masters, engineer officers and all personnel 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, paragraph 2 for service on liquefied gas tankers are to be considered as having met

[2] For information on how to obtain a complete copy of these documents, please see http://www.imo.org/en/Publications/Pages/Home.aspx

the requirements specified in section A-V/3, paragraph 2 for advanced training for ships subject to the IGF Code, provided they have also:

.1 met the requirements of paragraph 6; and

.2 met the bunkering requirements of paragraph 8.2 or have participated in conducting three cargo operations on board the liquefied gas tanker; and

.3 have completed seagoing service of three months in the previous five years on board:

.1 ships subject to the IGF Code;

.2 tankers carrying as cargo, fuels covered by the IGF Code; or

.3 ships using gases or low flashpoint fuel as fuel.

10 Every Party shall compare the standards of competence which it required of persons serving on gas-fuelled ships before 1 January 2017 with the standards of competence in Section A/V/3 of the STCW Code, and shall determine the need, if any, for requiring those personnel to update their qualifications.

11 Administrations shall ensure that a Certificate of Proficiency is issued to seafarers, who are qualified in accordance with paragraphs 4 or 7, as appropriate.

12 Seafarers holding Certificates of Proficiency in accordance with paragraphs 4 or 7 above 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.

AMENDMENTS TO THE STCW CODE

Chapter V

Standards regarding special training requirements for personnel on certain types of ships

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 for ships subject to the IGF Code

1 Every candidate for a certificate in basic training on ships subject to the IGF Code shall:

.1.1 have successfully completed the approved basic training required by regulation V/3, paragraph 5, in accordance with their capacity, duties and responsibilities as set out in Table A-V/3-1; and

.1.2 be required to provide evidence that the required standard of competence has been achieved in accordance with the methods and criteria for evaluating competence tabulated in columns 3 and 4 of Table A-V/3-1; or

.2 have received appropriate training and certification according to the requirements for service on liquefied gas tankers as set out in regulation V/3, paragraph 6.

Advanced training for ships subject to the IGF Code

2 Every candidate for a certificate in advanced training on ships subject to the IGF Code shall:

.1.1 have successfully completed the approved advanced training required by regulation V/3, paragraph 8, in accordance with their capacity, duties and responsibilities as set out in Table A-V/3-2; and

.1.2 be required to provide evidence that the required standard of competence has been achieved in accordance with the methods and criteria for evaluating competence tabulated in columns 3 and 4 of Table A-V/3-2; or

.2 have received appropriate training and certification according to the requirements for service on liquefied gas tankers as set out in regulation V/3, paragraph 9.

Exemptions

3 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.

Table A-V/3-1
Specification of minimum standard of competence in basic training for ships subject to the IGF Code

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Contribute to the safe operation of a ship subject to the IGF Code	Design and operational characteristics of ships subject to the IGF Code Basic knowledge of ships subject to the IGF Code, their fuel systems and fuel storage systems: .1 fuels addressed by the IGF Code .2 types of fuel systems subject to the IGF Code .3 atmospheric, cryogenic or compressed storage systems on board ships subject to the IGF Code .4 general arrangements of fuel storage systems on board ships subject to the IGF Code .5 hazard zones and areas .6 typical firs safety plan .7 monitoring, control and safety systems aboard ships subject to the IGF Code Basic knowledge of fuels and fuel storage systems' operations on board ships subject to the IGF Code: .1 piping system and valves .2 atmospheric, compressed or cryogenic storage .3 relief systems and protection screens .4 basic bunkering operations and bunkering systems .5 protection against cryogenic accidents .6 fuel leak monitoring and detection Basic knowledge of the physical properties of fuels on board ships subject to the IGF Code, including: .1 Properties and characteristics .2 Pressure and temperature, including vapour pressure/ temperature relationship Knowledge and understanding of safety requirements and safety management on boards ships subject to the IGF Code	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 .4 approved training programme	Communications within the area of responsibility are clear and effective Operations related to ships subject to the IGF Code are carried out in accordance with accepted principles and procedures to ensure safety of operations

Table A-V/3-1 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstratingcompetence**	**Criteria for evaluating competence**
Take precautions to prevent hazards on a ship subject to the IGF Code	Basic knowledge of the hazards associated with operations on ships subject to the IGF Code, including: .1 health hazards .2 environmental hazards .3 reactivity hazards .4 corrosion hazards .5 ignition, explosion and flammability hazards .6 sources of ignition .7 electrostatic hazards .8 toxicity hazards .9 vapour leaks and clouds .10 extremely low temperatures .11 pressure hazards .12 fuel batch differences Basic knowledge of hazard controls: .1 emptying, inerting, drying and monitoring techniques .2 anti-static measures .3 ventilation .4 segregation .5 inhibition .6 measures to prevent ignition, fire and explosion .7 atmospheric control .8 gas testing .9 protection against cryogenic damages (LNG) Understanding of fuel characteristics on ships subject to the IGF Code as found on a Safety Data Sheet (SDS)	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 .4 approved training programme	Correctly identifies, on a Safety Data Sheet (SDS), relevant hazards to the ship and to personnel, and takes the appropriate actions in accordance with established procedures Identification and actions on becoming aware of a hazardous situation conform to established procedures in line with best practice

Table A-V/3-1 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Apply occupational health and safety precautions and measures	Awareness of function of gas-measuring instruments and similar equipment: .1 Gas testing Proper use of specialized safety equipment and protective devices, including: .1 Breathing apparatus .2 Protective clothing .3 Resuscitators .4 Rescue and escape equipment 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: .1 Precautions to be taken before entering hazardous spaces and zones .2 Precautions to be taken before and during repair and maintenance work .3 Safety measures for hot and cold work Basic knowledge of first aid with reference to a Safety Data Sheet (SDS)	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 .4 approved training programme	Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times Appropriate safety and protective equipment is correctly used First aid do's and don't's
Carry out fire-fighting operations on a ship subject to the IGF Code	Fire organization and action to be taken on ships subject to the IGF Code Special hazards associated with fuel systems and fuel handling on ships subject to the IGF Code Fire-fighting agents and methods used to control and extinguish fires in conjunction with the different fuels found on board ships subject to the IGF Code Fire-fighting system operations	Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g. Simulated shipboard conditions) and, whenever possible and practicable, in darkness	Initial actions and follow-up actions on becoming aware of an emergency conform with established practices and procedures Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures Clothing and equipment are appropriate to the nature of the fire-fighting operations The timing and sequence of individual actions are appropriate to the prevailing circumstances and conditions Extinguishment of fire achieved using appropriate procedures techniques and fire-fighting agents

Table A-V/3-1 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Respond to emergencies	Basic knowledge of emergency procedures, including emergency shutdown	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 .4 approved training programme	The type and impact of the emergency is promptly identified, and the response actions conform to the emergency procedures and contingency plans
Take precautions to prevent pollution of the environment from the release of fuels found on ships subject to the IGF Code	Basic knowledge of measures to be taken in the event of leakage/ spillage/venting of fuels from ships subject to the IGF Code, including the need to: .1 Report relevant information to the responsible persons .2 Awareness of shipboard spill/ leakage/venting response procedures .3 Awareness of appropriate personal protection when responding to a spill/leakage of fuels addressed by the IGF Code.	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 .4 approved training programme	Procedures designed to safeguard the environment are observed at all times

Table A-V/3-2

Specification of minimum standard of competence in advanced training for ships subject to the IGF Code

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Familiarity with physical and chemical properties of fuels aboard ships subject to the IGF Code	Basic knowledge and understanding of simple chemistry and physics and the relevant definitions related to safe bunkering and use of fuels used on board ships subject to the IGF Code, including: .1 the chemical structure of different fuels on board ships subject to the IGF Code .2 the properties and characteristics of fuels used on board ships subject to the IGF Code, including: .2.1 simple physical laws .2.2 states of matter .2.3 liquid and vapour densities .2.4 boil-off and weathering of cryogenic fuels .2.5 compression and expansion of gases .2.6 critical pressure and temperature of gases .2.7 flashpoint, upper and lower flammable limits, auto-ignition temperature .2.8 saturated vapour pressure/ reference temperature .2.9 dewpoint and bubble point .2.10 hydrate formation .2.11 combustion properties: heating values .2.12 methane number/ knocking .2.13 pollutant characteristics of fuels addressed by the IGF Code .3 the principles of single liquids .4 the nature and properties of solutions	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 .4 approved training programme	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

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Familiarity with physical and chemical properties of fuels aboard ships subject to the IGF Code *(continued)*	.5 thermodynamic units .6 basic thermodynamic laws and diagrams .7 properties of materials .8 effect of low temperature, including brittle fracture, for liquid cryogenic fuels Understanding the information contained in a Safety Data Sheet (SDS) about fuels addressed by the IGF Code		
Operate controls of fuel related to propulsion plant and engineering systems and services and safety devices on ships subject to the IGF Code	Operating principles of marine power plants Ships' auxiliary machinery Knowledge of marine engineering terms	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 .4 approved training programme	Plant, auxiliary machinery and equipment is operated in accordance with technical specifications and within safe operating limits at all times

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Ability to safely perform and monitor all operations related to the fuels used on board ships subject to the IGF Code	Design and characteristics of ships subject to the IGF Code Knowledge of ship design, systems and equipment found on ships subject to the IGF Code, including: .1 fuel systems for different propulsion engines .2 general arrangement and construction .3 fuel storage systems on board ships subject to the IGF Code, including materials of construction and insulation .4 fuel-handling equipment and instrumentations on board ships .4.1 fuel pumps and pumping arrangements .4.2 fuel pipelines .4.3 expansion devices .4.4 flame screens .4.5 temperature monitoring systems .4.6 fuel tank gauging systems .4.7 tank pressure monitoring and control systems .5 cryogenic fuel tanks temperature and pressure maintenance .6 fuel system atmosphere control systems (inert gas, nitrogen), including storage, generation and distribution .7 Toxic and flammable gas-detecting systems .8 Fuel Emergency Shut Down (ESD)	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 .4 approved training programme	Communications are clear and understood Successful ship operations using fuels addressed by the IGF Code are carried out in a safe manner, taking into account ship designs, systems, and equipment Pumping operations are carried out in accordance with accepted principles and procedures and are relevant to the type of fuel Operations are planned, risk is managed and carried out in accordance with accepted principles and procedures to ensure safety of operations and to avoid pollution of the marine environment

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Ability to safely perform and monitor all operations related to the fuels used on board ships subject to the IGF Code *(Continued)*	Knowledge of fuel system theory and characteristics, including types of fuels systems pumps and their safe operation on board ships subject to the IGF Code .1 low pressure pumps .2 high pressure pumps .3 vaporizers .4 heaters .5 pressure build up units Knowledge of safe procedures and checklists for taking fuel tanks in and out of service, including: .1 inerting .2 cooling down .3 initial loading .4 pressure control .5 heating of fuel .6 emptying systems		

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Plan and monitor safe bunkering, stowage and securing of the fuel on board ships subject to the IGF Code	General knowledge of ships subject to the IGF Code Ability to use all data available on board related to bunkering, storage and securing of fuels addressed by the IGF Code Ability to establish clear and concise communications and between the ship and the terminal, truck or the bunker-supply ship Knowledge of safety and emergency procedures for operation of machinery, fuel and control systems for ships subject to the IGF Code Proficiency in the operation of bunkering systems on board ships subject to the IGF Code including: .1 bunkering procedures .2 emergency procedures .3 ship-shore/ship-ship interface .4 prevention of rollover Proficiency to perform fuel system measurements and calculations, including: 1. maximum fill quantity 2. On Board Quantity (OBQ) 3. Minimum Remain On Board (ROB) 4. Fuel consumption calculations Ability to ensure the safe management of bunkering and other IGF Code fuel related operations concurrent with other onboard operations, both in port and at sea	Examination and assessment of evidence obtained from one or more of the following: .1 approved in service experience .2 approved simulator training .3 approved training programme .4 approved laboratory equipment training or witnessing bunker operation	Fuel quality and quantity is determined taking into account the current conditions and necessary corrective safe measures are taken Procedures for monitoring safety systems to ensure that all alarms are detected promptly and acted upon in accordance with established procedures Operations are planned and carried out in accordance with fuel transfer manuals and procedures to ensure safety op operations and avouid spill damages and pollution of the environment 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

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Take precautions to prevent pollution of the environment from the release of fuels from ships subject to the IGF Code	Knowledge of the effects of pollution on human and environment Knowledge of measures to be taken in the event of spillage/ leakage/ venting	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 4. approved training programme	Procedures designed to safeguard the environment are observed at all times
Monitor and control compliance with legislative requirements	Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL), as amended and other relevant IMO instruments, industry guidelines and port regulations as commonly applied Proficiency in the use of the IGF Code and related documents	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 4. approved training programme	The handling of fuels on board ships subject to the IGF Code complies with the relevant IMO instruments and established industrial standards and codes of safe working practices Operations are planned and performed in conformity with approved procedures and legislative requirements

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Take precautions to prevent hazards	Knowledge and understanding of the hazards and control measures associated with fuel system operations on board ships subject to the IGF Code, including: 1. flammability 2. explosion 3. toxicity 4. reactivity 5. corrosivity 6. health hazards 7. inert gas composition 8. electrostatic hazards 9. pressurized gases 10. low temperature Proficiency to calibrate and use monitoring and fuel detection systems, instruments and equipment on board ships subject to the IGF Code Knowledge and understanding of dangers of non-compliance with relevant rules/regulations Knowledge and understanding of risks assessment method analysis on board ships subject to the IGF Code Ability to elaborate and develop risks analysis related to risks on board ships subject to the IGF Code Ability to elaborate and develop safety plans and safety instructions for ships subject to the IGF Code Knowledge of hot work, enclosed spaces and tank entry including permitting procedures	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 4. approved training programme	Relevant hazards to the ship and to personnel associated with operations on board ships subject to the IGF Code are correctly identified and proper control measures are taken Use of flammable and toxic gas detection devices are in accordance with manuals and good practice

Table A-V/3-2 *(continued)*

Column 1	Column 2	Column 3	Column 4
Competence	**Knowledge, understanding and proficiency**	**Methods for demonstrating competence**	**Criteria for evaluating competence**
Apply occupational health and safety precautions and measures on board a ship subject to the IGF Code	Proper use of safety equipment and protective devices, including: 1. breathing apparatus and evacuating equipment 2. protective clothing and equipment 3. resuscitators 4. rescue and escape equipment Knowledge of safe working practices and procedures in accordance with legislation and industry guidelines and personal shipboard safety including: 1. precautions to be taken before, during and after repair and maintenance work on fuel systems addressed in the IGF Code 2. electrical safety (reference to IEC 60079-17) 3. ship/shore safety checklist Basic knowledge of first aid with reference to a Safety Data Sheets (SDS) for fuels addressed by the IGF Code	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 4. approved training programme	Appropriate safety and protective equipment is correctly used Procedures designed to safeguard personnel and the ship are observed at all times Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns First aid do's and don'ts
Knowledge of the prevention, control and fire fighting and extinguishing systems on board ships subject to the IGF Code	Knowledge of the methods and fire-fighting appliances to detect, control and extinguish fires of fuels addressed by the IGF Code	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 4. approved training programme	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 Evacuation, emergency shutdown and isolation procedures are appropriate to the fuels addressed by the IGF Code