

Performance and Qualification Standard

US Domestic Deepdraft Low Flashpoint Fuel Addendum (LFFMI)

This Performance and Qualification Standard (PQS) workbook is an addendum to the Machinery (MI) PQS qualification and is your On the Job Training (OJT) performance checklist for certification to Inspect the fuel systems on Low Flashpoint Fuel (LFF) powered vessels. This qualification is only for the inspection of the arrangement, installation, control and monitoring of machinery, equipment and systems using low-flashpoint fuels. It is your responsibility to document all completed unit training items and keep track of all inspections completed during this process by filling out the Inspection Log located in this workbook.

This PQS workbook cites from the International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code); and additional noteworthy Interim Guideline Requirements.

The current version of this PQS only includes standards to meet the functional requirement for natural gas fuels. Other low-flashpoint fuels will be added as regulations are developed.

PQS VERIFYING OFFICER SIGNATURE VERIFICATION LOG

RATE/ RANK	SIGNATURE/ PRINT NAME	EMPLID	INITIALS	UNIT
REMARKS:				

Low Flashpoint Fuel Addendum PQS

RECORD OF COMPLETION		
Training Prerequisites	Date	Training Coordinator's Signature
A. Completion of Core (HI/MI) PQS Workbook		
B. Completion of Machinery (MI) PQS Workbook		
C. Completion of on-line course: Alternate Fuels - Introduction to Liquefied Natural Gas, Self-Paced E-Learning (100355)		
D. Completion of this PQS Workbook		
E. Successful completion of final assessment under the observation of the Verifying Officer		
F. Successful completion of the final oral qualification board		
Qualification Board Members:		
G. Certification/Designation Letter submitted for approval		
H. Once Certification/Designation Letter is signed, enter competency & certification in TMT		
REMARKS:		

Low Flashpoint Fuel Addendum PQS

Task Number	Task Description	Date Completed
LFFMI-PI01	Research vessel details in the Marine information for Safety and Law Enforcement (MISLE) database	
LFFMI-PI02	Conduct safety meeting	
LFFMI-CD01	Inspect crew training documentation	
LFFMI-CD02	Inspect LNG as fuel endorsements	
LFFMI-CD03	Inspect regulatory documents	
LFFMI-LM01	Inspect maintenance & repair procedures	
LFFMI-LM02	Inspect operational procedures & fuel handling manual	
LFFMI-LM03	Inspect emergency procedures	
LFFMI-LM04	Inspect bunker procedures	
LFFMI-LM05	Inspect electrical equipment maintenance manual	
LFFMI-LM06	Inspect inspection/survey plan for LNG fuel containment system	
LFFMI-LM07	Inspect training manual, drills & exercises	
LFFMI-GH01	Inspect airlocks	
LFFMI-GH02	Inspect personnel protection equipment (PPE)	
LFFMI-FF01	Inspect water spray systems	
LFFMI-FF02	Inspect fixed dry chemical powder extinguishing system	
LFFMI-FF03	Inspect fire detection & alarm system	
LFFMI-FF04	Inspect structural fire protection (SFP)	
LFFMI-MI01	Inspect ventilation	
LFFMI-MI02	Inspect Gas Compressors	
LFFMI-MI03	Inspect ESD Protected Machinery Space	
LFFMI-MI04	Inspect Gas consumers	
LFFMI-MI05	Inspect Gas Safe Machinery Space	
LFFMI-MI06	Inspect bilge system	
LFFMI-FT01	Inspect bunkering station	
LFFMI-FT02	Inspect bunkering control location	
LFFMI-FT03	Inspect fuel containment	
LFFMI-FT04	Inspect fuel tank monitoring	

Low Flashpoint Fuel Addendum PQS

Task Number	Task Description	Date Completed
LFFMI-FT05	Inspect pressure relief systems for LG fuel tanks	
LFFMI-FT06	Inspect means of maintaining fuel storage condition	
LFFMI-FT07	Inspect fuel containment system atmospheric controls	
LFFMI-FT08	Inspect inert gas system	
LFFMI-FT09	Inspect fuel piping	
LFFMI-FT10	Inspect safety functions of gas & fuel supply system	
LFFMI-FT11	Inspect gas detection system	
LFFMI-FT12	Inspect system redundancy	
LFFMI-ES01	Inspect hazardous areas	
LFFMI-ES02	Inspect low - low liquid alarm & shutdown	
LFFMI-ED01	Verify drills are conducted	
LFFMI-FU01	Complete MISLE Activity	
LFFMI-FU02	Complete Deficiency Write-up	

Pre-Inspection (PI)

LFF Fueled Vessels

Task: LFFMI-PI01 Research vessel details in the Marine Information for Safety and Law Enforcement (MISLE) database

Condition: *During preparation for inspection*

Standard: *In accordance with current policies, procedures and processes*

- References:**
1. Title 46, Code of Federal Regulations Parts 30, 70 & 90
 2. Design Basis Agreement Letter
 3. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel
 4. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 5. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 6. International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended

Steps		References	Initials
PI01.1	Determine authority, jurisdiction & applicable references	46 CFR 30.15, 70.15 & 90.15 CG-OES Policy Ltr 01-15 & CG-ENG Policy Ltr 01-12 Ch-1 Design Basis Agreement Ltr	
PI01.2	Review Design Basis Agreement Letter	Design Basis Agreement Ltr	
PI01.3	Review special notes pertaining alternative design arrangements	CG-ENG Policy Ltr 01-12 Ch-1 IGF Code 2.3 SOLAS 20 II-1/55	
PI01.4	Review special notes pertaining to system configuration	IGF Code 5.4.1 IGF Code 9.6 IGF Code 9.7	
PI01.5	Review special notes pertaining to independent tanks	IGF Code 2.2.23 IGF Code 6.4.15.1 & .2 IGF Code 6.4.15.3	
PI01.6	Review special notes pertaining to membrane tanks	IGF Code 2.2.31 IGF Code 6.4.15.4	
PI01.7	Review special notes pertaining to secondary barrier	IGF Code 6.4.3 IGF Code 6.4.4.4 IGF Code 2.2.37	
PI01.8	Review Periodic Safety Test Procedures for gas fuel systems	CG-ENG Policy Ltr 01-12 Ch-1, 15.3	

Verifying Officer Guidance: *VO shall ensure the trainees understand what a Design Basis Agreement (DBA) is and the details enclosed.*

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Low-flashpoint fuel systems on domestic vessels are addressed through equivalency to the 46 CFR Subchapter that the vessel is being certificated under (reference to §30.15, 70.15 & 90.15 above is for illustrative purposes).

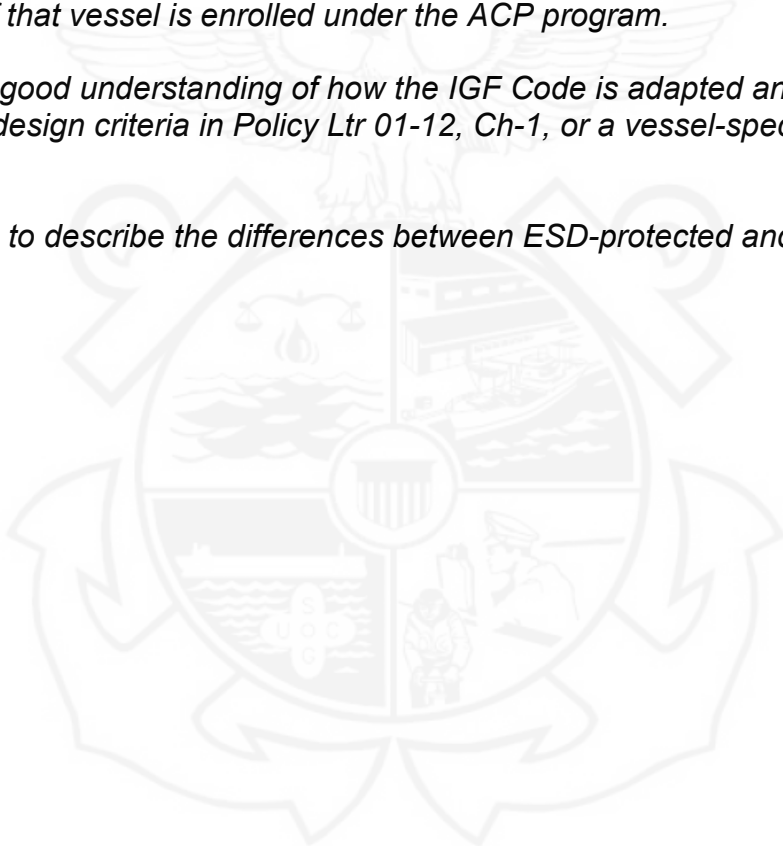
That equivalency will either take the form of a vessel-specific Design Basis Agreement (DBA) Letter issued by Commandant (CG-ENG), or compliance with criteria set out in CG-ENG Policy Ltr 01-12, Ch-1, which uses the IGF Code as a baseline standard for equivalency.

Vessels constructed before the IGF Code took effect on 01 January 2017 may be subject to the IMO's Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships (IMO Resolution MSC.285(86)), adopted on 01 June 2009, by following CG-521 Policy Ltr 01-12, or through a vessel-specific DBA that references those interim guidelines as a precursor to the IGF Code.

Note that CG retains 100% of inspection for a vessel's low-flashpoint fuel system, and associated safety systems, even if that vessel is enrolled under the ACP program.

Trainee should have a good understanding of how the IGF Code is adapted and applied as an equivalency using the design criteria in Policy Ltr 01-12, Ch-1, or a vessel-specific DBA.

Trainee should be able to describe the differences between ESD-protected and gas safe machinery spaces.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Pre-Inspection (PI)

LFF Fueled Vessels

Task: LFFMI-PI02 Conduct safety meeting

Condition: *During preparation for inspection*

Standard: *In accordance with current policies, procedures and processes*

- References:**
1. COMDTINST M16000.6 Marine Safety Manual Volume I Administration & Management
 2. International Chamber of Shipping Tanker Safety Guide Liquefied Gas

Steps		References	Initials
PI02.1	Ensure team is aware of safety hazards associated with fuels	MSM I/10.C.1.a Tanker Safety Guide	
PI02.2	Verify team is outfitted with appropriate PPE	MSM I/10.D.5.a MSM I/8.A.3	

Verifying Officer Guidance: *PI02.1: i.e., long sleeve coveralls, gloves, safety toe shoes, hard hat, etc. PI02.2: i.e., multi gas meters. Using CG policy, unit policy to determine if a marine chemist is required to go into certain spaces on board the ship.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Certificates and Documents (CD)

LFF Fueled Vessels

Task: LFFMI-CD01 Inspect crew training documentation

Condition: While validating certificates and documents

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Convention on Standards of Training, Certification & Watchkeeping (STCW) 1978, as amended
 2. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 3. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel
 4. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
CD01.1	Verify basic training	IGF Code 19.2 STCW V/3.4 CG-OES Policy Ltr 01-15 Encl. 3	
CD01.2	Verify advanced training	IGF Code 19.2 STCW V/3.7 CG-OES Policy Ltr 01-15 Encl. 3	
CD01.3	Verify training for personnel conducting maintenance on electrical equipment in hazardous areas	IGF Code 14.3.3; 18.3.3 IMO Res MSC.285(86) 8.3.4	

Verifying Officer Guidance: *The standards for electrical equipment in hazardous areas are addressed in Policy Letter 01-12, CH-1, (see “Chapter 14” on page 7 of Enclosure (1) to the Policy Ltr), or will be detailed in a DBA specific for that vessel. These typically provide an option of choosing a scheme in compliance with either NFPA 70 (National Electric Code), or IEC standards – very similar to the approach in 46 CFR 111.105. As the Flag Administration, the Coast Guard specifies in our Policy Letter 01-12, CH-1, or in any vessel-specific DBA, what standards we accept as being “at least equivalent to those acceptable to the Organization” under IGF Code 14.3.3.*

** Note, that the footnotes in the IGF Code are considered by IMO as either referential or recommendatory in nature, and provide useful information but are not considered a mandatory part of the code. This is clarified by IMO in MSC Committee Report MSC 96/25, as well as in MSC.1 Circ. 1483.*

Basic and advanced STCW training for LFF is not required to be on mariner’s credential (CG-MMC 01-21), but the crew handling the fuel must receive some training as per IAW CG-OES Policy Ltr 01-15.

Inspector’s Name: (Last, First, Initial)	EMPLID:
Verifying Officer’s Signature:	Date:

PIC endorsement guidance: It is important that the MI verify that the designated PIC does have training IAW CG-OES Policy Ltr No. 01-15 Qualifications of PIC: Each person designated as a person in charge of a LNG fuel transfer operation should meet the following qualifications: (1) Holds an MMC with an appropriate officer endorsement issued under 46 CFR part 10 and 11, or STCW Chapter II or III for foreign flag vessels, authorizing service on board the vessel; and (2) Meets the training guidance of IMO's, STCW.7/Circ.23, or Enclosure 3, for Advanced training.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Certificates and Documents (CD)

LFF Fueled Vessels

Task: LFFMI-CD02 Inspect LNG as fuel endorsements

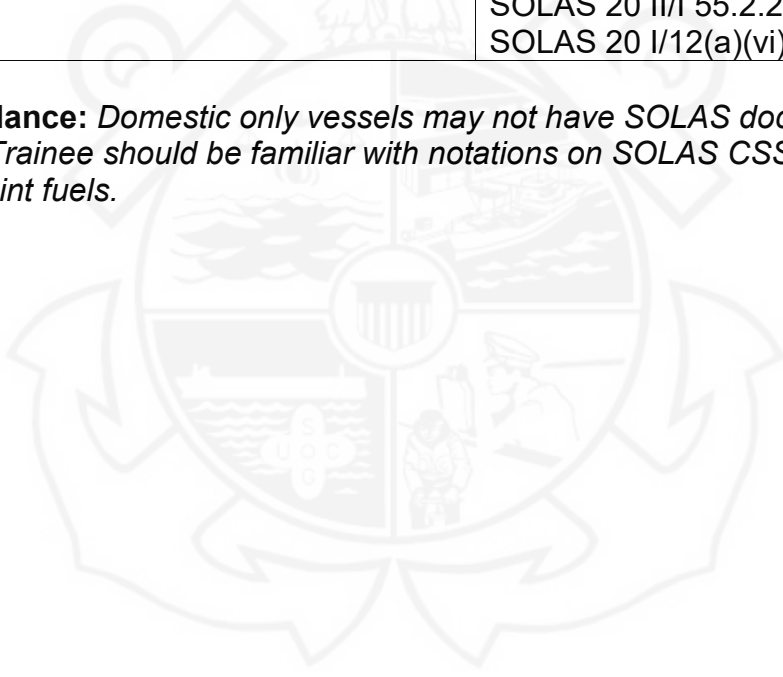
Condition: While validating certificates and documents

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended
 2. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 3. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
CD02.1	Verify Classification document (if applicable)	IGF Code 3.2.17 CG-ENG Policy Ltr 01-12 Ch-1 2.1	
CD02.2	Verify Cargo Ship Safety Construction Certificate	SOLAS 20 Appendix A SOLAS 20 II/I 55.2.2.2 SOLAS 20 I/12(a)(vi)	

Verifying Officer Guidance: Domestic only vessels may not have SOLAS documents, look on COI for fuel endorsement. Trainee should be familiar with notations on SOLAS CSSC regarding alternative design and low flashpoint fuels.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Certificates and Documents (CD)

LFF Fueled Vessels

Task: LFFMI-CD03 Inspect regulatory documents

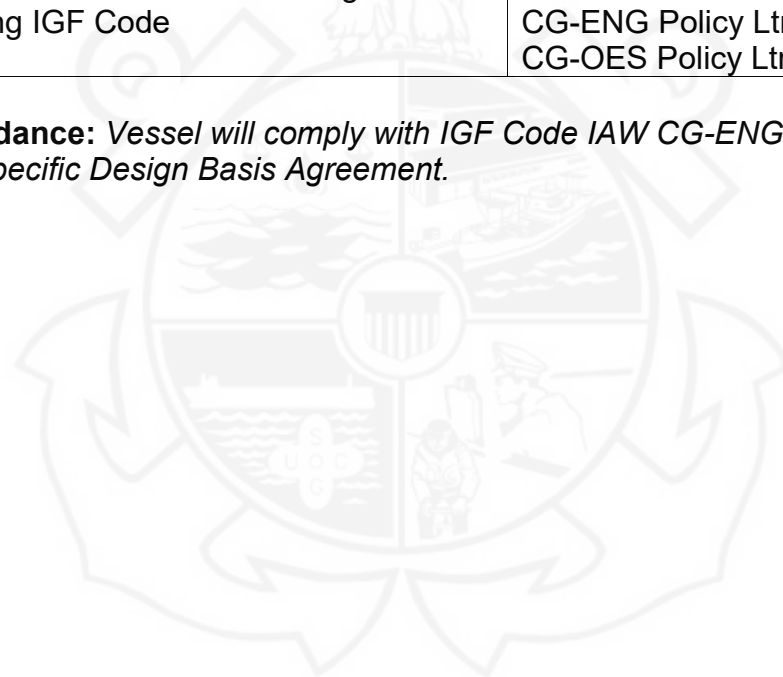
Condition: While validating certificates and documents

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 3. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel

Steps		References	Initials
CD03.1	Verify presence of IGF Code	IGF Code 18.2.1	
CD03.2	Verify presence of administration regulations incorporating IGF Code	IGF Code 18.2.1 CG-ENG Policy Ltr, 01-12, Ch-1 CG-OES Policy Ltr 01-15	

Verifying Officer Guidance: Vessel will comply with IGF Code IAW CG-ENG Policy Letter 01-12 CH-1, or follow a vessel-specific Design Basis Agreement.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Logs and Manuals Inspection (LM)

LFF Fueled Vessels

Task: LFFMI-LM01 Inspect maintenance & repair procedures

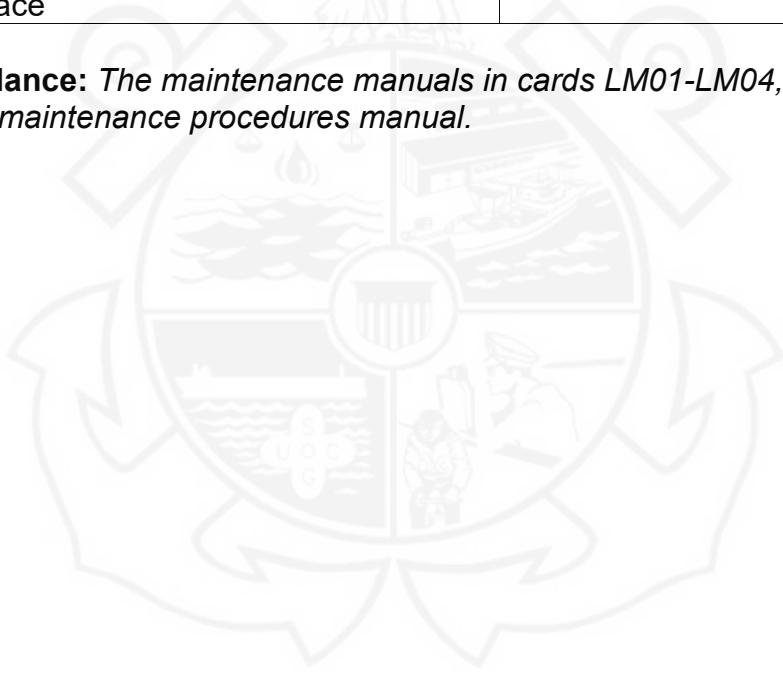
Condition: While validating logs and manuals

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel

Steps		References	Initials
LM01.1	Verify presence	IGF Code 18.2.2 CG-OES Policy Ltr 01-15 Encl. 1	
LM01.2	Review maintenance and repair procedures to include consideration of tank location and adjacent space	IGF Code 18.3.1 IGF Code Chapter 5	

Verifying Officer Guidance: *The maintenance manuals in cards LM01-LM04, LM06, may be combined in a general maintenance procedures manual.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Task: LFFMI-LM02 Inspect operational procedures & fuel handling manual

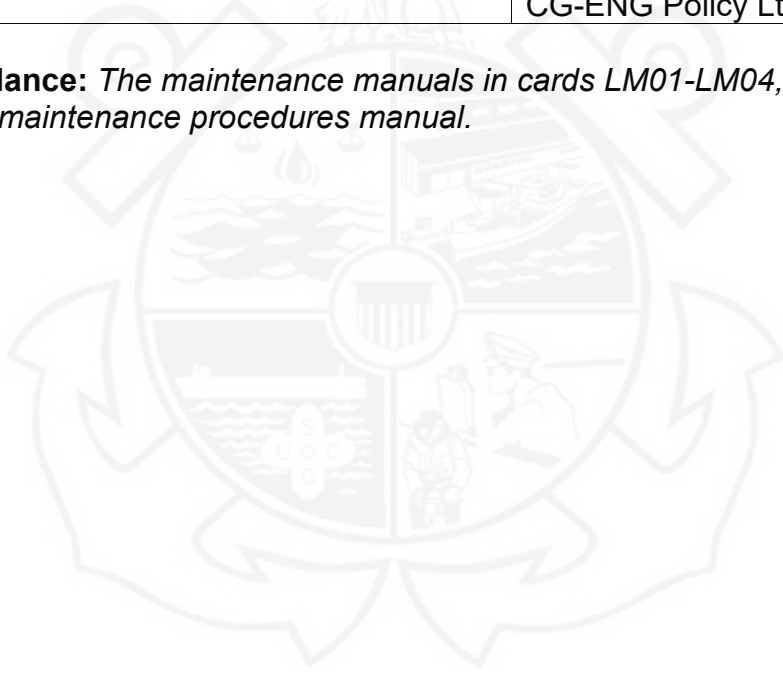
Condition: While validating logs and manuals

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
LM02.1	Verify presence	IGF Code 18.2.3 CG-ENG Policy Ltr 01-12 Ch-1	
LM02.2	Verify contents	IGF Code 18.4.2.1 & 18.6.2 IGF Code 6.3.12 CG-ENG Policy Ltr 01-12 Ch-1	

Verifying Officer Guidance: *The maintenance manuals in cards LM01-LM04, LM06, may be combined in a general maintenance procedures manual.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Logs and Manuals Inspection (LM)

LFF Fueled Vessels

Task: LFFMI-LM03 Inspect emergency procedures

Condition: While validating logs and manuals

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel

Steps		References	Initials
LM03.1	Verify presence	IGF Code 18.2.4 CG-OES Policy Ltr 01-15 Encl. 1	

Verifying Officer Guidance: *The maintenance manuals in cards LM01-LM04, LM06, may be combined in a general maintenance procedures manual.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Logs and Manuals Inspection (LM)

LFF Fueled Vessels

Task: LFFMI-LM04 Inspect bunker procedures

Condition: While validating logs and manuals

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel
 3. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
LM04.1	Verify presence	IGF Code 18.4.1.1 & .2 CG-OES Policy Ltr 01-15 Encl. 1	
LM04.2	Verify completion of safety checklist	IGF Code 18.4.1.1.3 IGF Code 18.4.3	
LM04.3	Verify PICs have signed copies of Delivery notes designation	IGF Code 18.4.1.2 IGF Code 18 Annex 1	
LM04.4	Verify storage tank fill limits	IGF Code 6.8 CG-ENG Policy Ltr 01-12 Ch-1, 6.8.2	
LM04.5	Verify portable tanks (if applicable) are addressed in procedures	IGF Code 18.4.6.3 IGF Code 6.5 CG-ENG Policy Ltr 01-12 Ch-1, 6.8.2	

Verifying Officer Guidance: Trainee should be able to explain the difference between loading and filling limits. IAW COTP policy, verify vessel provides appropriate advance notice of transfer operations per OES Policy Letter 01-15 Encl. 1.

Flange Specific Bunkering Procedures Verification: Vessel should be able to produce procedures explaining how they will prove bunker lines are inerted prior to separating the flange; if no QCDC. (This is to prevent any release of LNG from bunker lines/manifold following bunkering.)

Note 1: In verifying step 2, the procedures should include a loading limit curve for actual loading limit temperatures as required in IGF Code 6.8.1. If a loading limit greater than that calculated under 6.8.1 (but not above 95%) is to be used it must have been pre-approved (see CG-ENG Policy Ltr 01-12 Ch-1, 6.8.2).

Note 2: If pressure can only be maintained/controlled by fuel consumers, the loading limit as calculated in 6.8.1 shall be used.

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Logs and Manuals Inspection (LM)

LFF Fueled Vessels

Task: LFFMI-LM05 Inspect electrical equipment maintenance manual

Condition: While validating logs and manuals

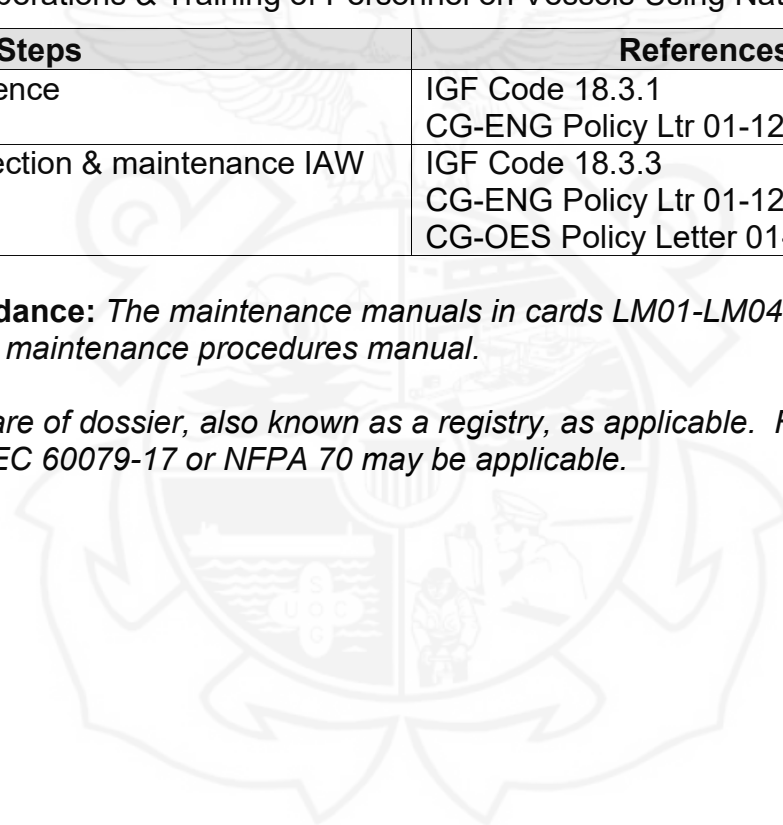
Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 3. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel

Steps		References	Initials
LM05.1	Verify presence	IGF Code 18.3.1 CG-ENG Policy Ltr 01-12 Ch-1 14.3	
LM05.2	Verify inspection & maintenance IAW standards	IGF Code 18.3.3 CG-ENG Policy Ltr 01-12 Ch-1 14.3 CG-OES Policy Letter 01-15 Encl (1) c.	

Verifying Officer Guidance: *The maintenance manuals in cards LM01-LM04, LM06, may be combined in a general maintenance procedures manual.*

Trainee should be aware of dossier, also known as a registry, as applicable. For step 2, ensure trainee is aware that IEC 60079-17 or NFPA 70 may be applicable.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Logs and Manuals Inspection (LM)

LFF Fueled Vessels

Task: LFFMI-LM06 Inspect inspection/survey plan for LNG fuel containment system

Condition: While validating logs and manuals

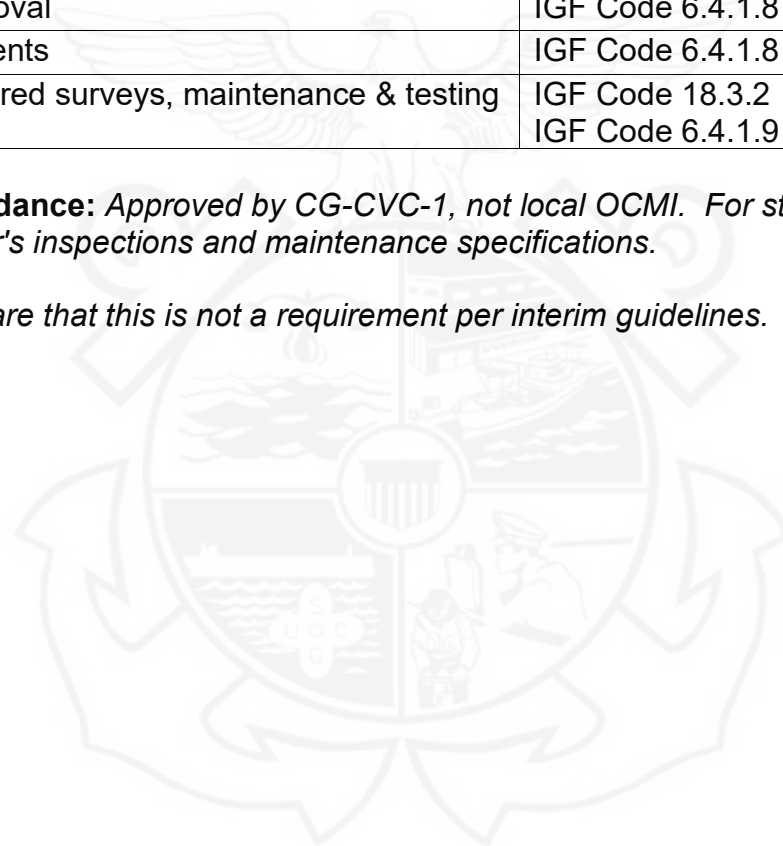
Standard: In compliance with applicable policies, laws, regulations and standards

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
LM06.1	Verify presence	IGF Code 18.2.2	
LM06.2	Verify approval	IGF Code 6.4.1.8	
LM06.3	Verify contents	IGF Code 6.4.1.8	
LM06.4	Verify required surveys, maintenance & testing completed	IGF Code 18.3.2 IGF Code 6.4.1.9	

Verifying Officer Guidance: Approved by CG-CVC-1, not local OCMI. For step 3, trainees should be aware of manufacturer's inspections and maintenance specifications.

Trainee should be aware that this is not a requirement per interim guidelines.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Logs and Manuals Inspection (LM)

LFF Fueled Vessels

Task: LFFMI-LM07 Inspect training manual, drills & exercises

Condition: While validating logs and manuals

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel

Steps		References	Initials
LM07.1	Verify emergency drills are performed	IGF Code 17 CG-OES Policy Ltr 01-15 Encl. 3	

Verifying Officer Guidance: *Vessel built prior to IGF Code falls under the interim guidelines, which may have a training manual. Example drills include: fire, ruptured hose, LNG spill on deck, etc.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

General Health & Safety Inspection (GH)

LFF Fueled Vessels

Task: LFFMI-GH01 Inspect airlocks

Condition: *During general health and safety inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
GH01.1	Verify presence	IGF Code 5.11.1 IGF Code 5.11.2 & .4	
GH01.2	Verify door self closing and no holding back	IGF Code 5.12.1 IGF Code 5.12.3	
GH01.3	Verify ventilation overpressure	IGF Code 5.12.2 IGF Code 13.3.9 & .10	
GH01.4	Verify free & easy passage	IGF Code 5.12.4	
GH01.5	Verify audible & visual alarms	IGF Code 5.12.5 & .6 IGF Code 13.3.9 & .10	
GH01.6	Verify continued operation of essential equipment	IGF Code 5.12.7	
GH01.7	Verify de-energization of non-certified electrical equipment with loss of overpressure	IGF Code 14.3.9	
GH01.8	Verify presence of gas detection	IGF Code 15.8.1.7	

Verifying Officer Guidance: *Trainee should understand the difference between overpressure and under pressure per IGF 13.3.9 and 13.3.10. For step 8, refer to Task FT11.*

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

General Health & Safety Inspection (GH)

LFF Fueled Vessels

Task: LFFMI-GH02 Inspect personnel protection equipment (PPE)

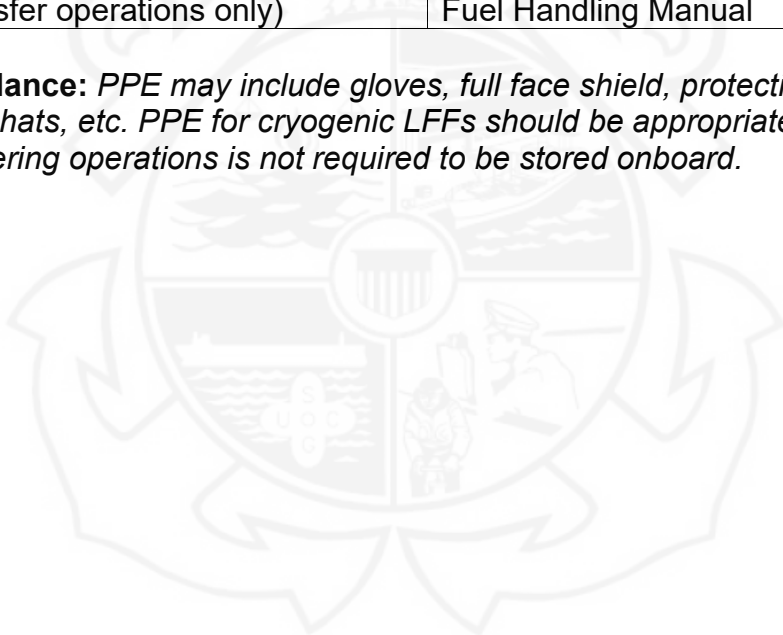
Condition: *During general health and safety inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel
 3. Vessel's Fuel Handling Manual

Steps		References	Initials
GH02.1	Verify specific fuel properties and special equipment needed for the safe handling of the particular fuel	IGF Code 18.4.6.2 CG-OES Policy Ltr 01-15 Encl. 1, p9 Fuel Handling Manual	
GH02.2	Verify appropriate PPE per vessel's (during transfer operations only)	IGF Code 18.4.6.2 Fuel Handling Manual	

Verifying Officer Guidance: *PPE may include gloves, full face shield, protective footwear, fit for purpose clothing, hard hats, etc. PPE for cryogenic LFFs should be appropriate for cryogenic use. The PPE required for bunkering operations is not required to be stored onboard.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Firefighting Systems Inspection (FF)

LFF Fueled Vessels

Task: LFFMI-FF01 Inspect water spray systems

Condition: During firefighting equipment inspection

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 3. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
FF01.1	Verify installation	IGF Code 11.5.1 & .2 CG-ENG Policy Ltr 01-12 Ch-1 11.5 IMO Res MSC.285(86) 3.3.2	
FF01.2	Verify capacity of fire main pump if used to supply system to operate simultaneously	IGF Code 11.5.3 & .5 CG-ENG Policy Ltr 01-12 Ch-1 11.5.6 IMO Res MSC.285(86) 3.3.2	
FF01.3	Verify fire main connection	IGF Code 11.5.6 IMO Res MSC.285(86) 3.3.1-2	
FF01.4	Verify stop valves are properly fitted in main supply line	IGF Code 11.5.4	
FF01.5	Verify nozzles	IGF Code 11.5.8 CG-ENG Policy Ltr 01-12 Ch-1 11.5.2 & .8 IMO Res MSC.285(86) 3.3.2.7	
FF01.6	Verify remote operation of pumps and valves	IGF Code 11.5.7	
FF01.7	Witness operational test of system	IGF Code 11.5.3 IGF Code 11.5.5	

Verifying Officer Guidance: For step 5, see CG-ENG Policy Letter 01-12 Ch-1, Encl. 1, 11.5.8 for nozzles.

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Firefighting Systems Inspection (FF)

LFF Fueled Vessels

Task: LFFMI-FF02 Inspect fixed dry chemical powder extinguishing system

Condition: During firefighting equipment inspection

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 3. IMO MSC.1/Circ. 1432 Revised Guidelines for the Maintenance and Inspection of Fire Protection Systems & Appliances
 4. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
FF02.1	Verify installation	IGF Code 11.6.1 CG-ENG Policy Ltr 01-12 Ch-1 11.6 IMO Res MSC.285(86) 3.3.3	
FF02.2	Verify servicing	IMO MSC.1/Circ. 1432	
FF02.3	Verify capacity	IGF Code 11.6.1 IMO Res MSC.285(86) 3.3.3	
FF02.4	Verify location of manual release	IGF Code 11.6.1 IMO Res MSC.285(86) 3.3.3	

Verifying Officer Guidance: Review CG-ENG Policy Letter 01-12 Ch-1 Encl. 1/11.6 for further information regarding these systems.

Trainee should be familiar with the applicability of MSC.1/Circ. 1432 to dry chemical systems.

**** No USCG Approved Systems, MSC will approve individual systems during design phase. ****

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Firefighting Systems Inspection (FF)

LFF Fueled Vessels

Task: LFFMI-FF03 Inspect fire detection & alarm system

Condition: *During firefighting equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. International Code for Fire Safety Systems (FSS Code), 2007
 3. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 4. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
FF03.1	Verify presence of fuel system fire detection & alarm	IGF Code 11.7.1, 15.9 CG-ENG Policy Ltr 01-12 Ch-1 11.7 IMO Res MSC.285(86) 3.4.1	
FF03.2	Verify presence of machinery space fire detection & alarm	IGF Code 11.7.1 FSS Code 2.3	
FF03.3	Witness operational test of fire detection & alarm systems	IGF Code 11.7 IGF Code 15.9	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Firefighting Systems Inspection (FF)

LFF Fueled Vessels

Task: LFFMI-FF04 Inspect structural fire protection (SFP)

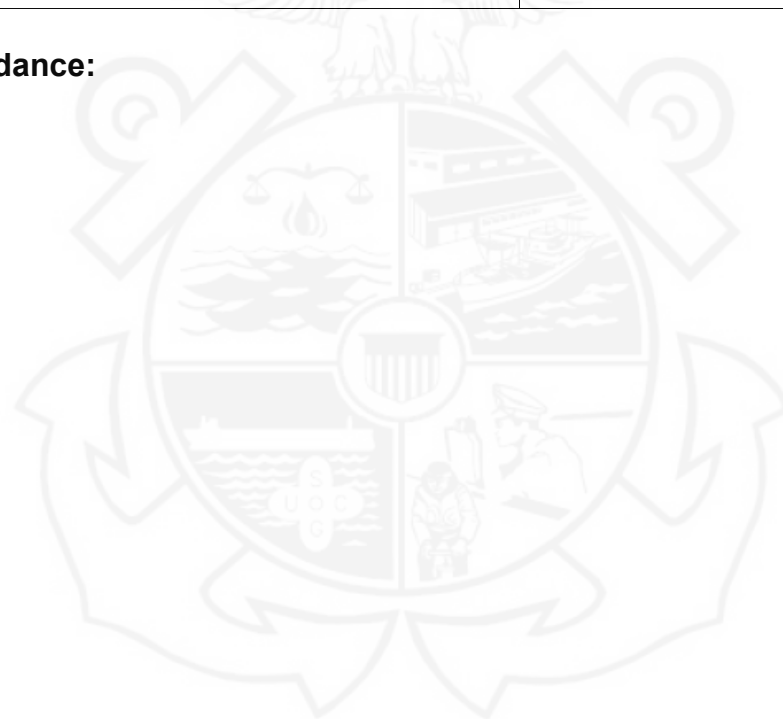
Condition: *During firefighting equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FF04.1	Verify SFP boundaries facing fuel tanks on open decks	IGF Code 11.3.2	
FF04.2	Verify SFP in space containing fuel containment system	IGF Code 11.3.3	
FF04.3	Verify SFP for bunker station boundaries	IGF Code 11.3.6	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Machinery Equipment Inspection (MI)

LFF Fueled Vessels

Task: LFFMI-MI01 Inspect ventilation

Condition: *During machinery equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
MI01.1	Verify inlet and outlet locations	IGF Code 6.7.2.8 IGF Code 13.3.5 & .6	
MI01.2	Verify operation of machinery spaces ventilation	IGF Code 13.5.1 & 2 IGF Code 13.6 IGF Code 15.10	
MI01.3	Verify construction of ventilation in double duct piping	IGF Code 13.8.1 IGF Code 13.8.2 IGF Code 13.8.4	
MI01.4	Witness loss of ventilation alarms and shutdowns.	IGF Code 15.2.2 IGF Code 15.10	
MI01.5	Verify operation of ventilation for fuel preparation room	IGF Code 13.6	

Verifying Officer Guidance: *Trainee should refer to IGF Code Regulation 15, Table 1 for quick reference regarding ventilation alarms & monitoring. Ensure inspector uses approved hazardous zone drawings to identify hazardous locations in way of ventilation openings.*

Inspector's Name: (Last, First, Initial)

EMPLID:

Verifying Officer's Signature:

Date:

Machinery Equipment Inspection (MI)

LFF Fueled Vessels

Task: LFFMI-MI02 Inspect Gas Compressors

Condition: *During machinery equipment inspection*

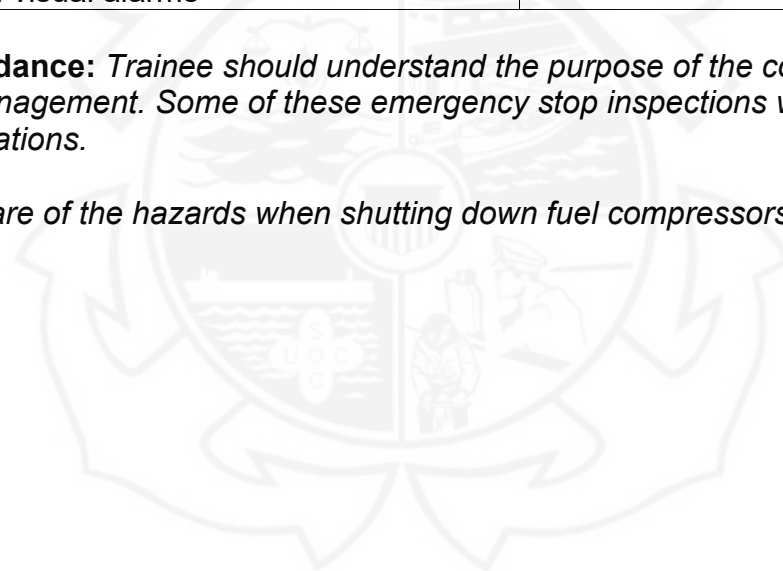
Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
MI02.1	Verify manual remote emergency stop locations	IGF Code 15.11.4	
MI02.2	Verify manual local emergency stop for gas compressor	IGF Code 15.11.4	
MI02.3	Witness operational test of emergency stops	IGF Code 15.11.4	
MI02.4	Witness operational test of gas compressor audible and visual alarms	IGF Code 15.6.1	
MI02.5	Witness operational test of shaft and bearings audible and visual alarms	IGF Code 15.6.2	

Verifying Officer Guidance: *Trainee should understand the purpose of the compressor in relation to boil-off-gas (BOG) management. Some of these emergency stop inspections will be accomplished during bunkering operations.*

Trainee should be aware of the hazards when shutting down fuel compressors.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Machinery Equipment Inspection (MI)

LFF Fueled Vessels

Task: LFFMI-MI03 Inspect ESD Protected Machinery Space

Condition: *During machinery equipment inspection*

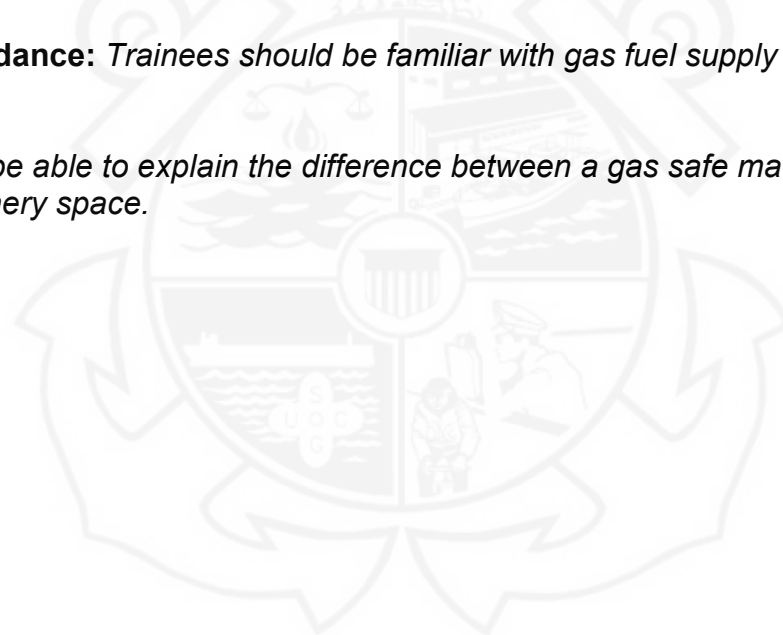
Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
MI03.1	Verify presence of redundant gas detection systems for ESD protected machinery spaces	IGF Code 15.8.2	
MI03.2	Verify operation of gas detection shutdowns and electrical equipment disconnects	IGF Code 5.6.3.3 IGF Code 12.3.3.2	
MI03.3	Verify arrangement of ventilation system	IGF Code 5.6.7 IGF Code 13.5	
MI03.4	Verify electrical equipment certification	IGF Code 12.3.3	

Verifying Officer Guidance: *Trainees should be familiar with gas fuel supply design pressures of IGF Code 9.7.*

Note: Trainee should be able to explain the difference between a gas safe machinery space and an ESD protected machinery space.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Task: LFFMI-MI04 Inspect Gas consumers

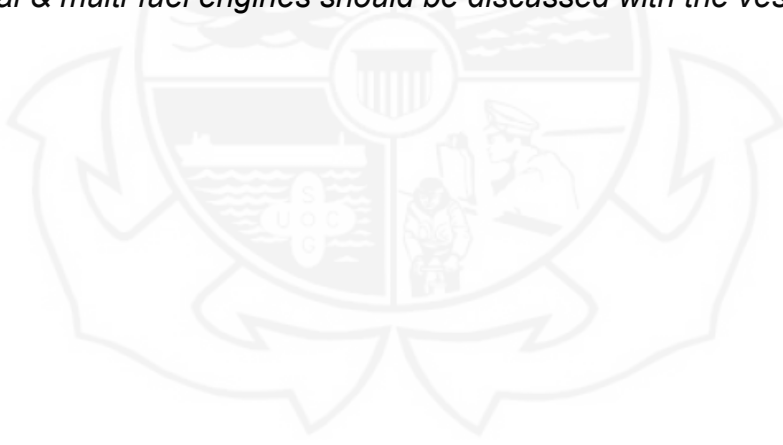
Condition: *During machinery equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
MI04.1	Determine combustion installation(s) (Piston, Boilers, Turbines)	IGF Code 10.3, 10.4 & 10.5	
MI04.2	Determine engine installation (Dual Fuel, Gas Only, or multi-fueled)	IGF Code 10.3.2, 10.3.3 & 10.3.4	
MI04.3	Verify arrangement of combustion installation (Piston, Boilers, Turbines)	IGF Code 10.3, 10.4 & 10.5	
MI04.4	Verify arrangement engine installation (Dual Fuel, Gas Only, or multi-fueled)	IGF Code 10.3.2, 10.3.3 & 10.3.4	

Verifying Officer Guidance: *Steps may be deferred if engine type is not available for inspection. Ensure trainees witness safeties IAW approved periodic safety testing procedures (PSTPs) and manufacturer's instructions. For high pressure systems, plan to get vessel underway. Fuel change over procedures for dual & multi-fuel engines should be discussed with the vessel Master and/or Chief Engineer.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Machinery Equipment Inspection (MI)

LFF Fueled Vessels

Task: LFFMI-MI05 Inspect Gas Safe Machinery Space

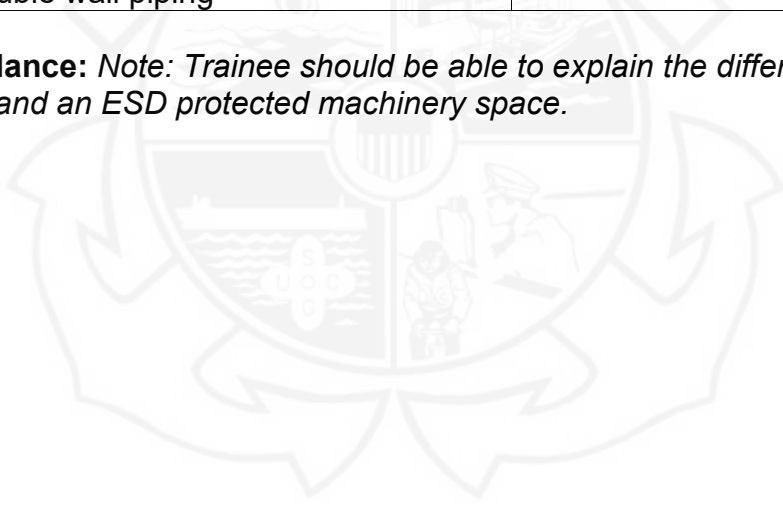
Condition: *During machinery equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
MI05.1	Verify presence of gas detection systems for Gas Safe Machinery Space	IGF Code 15.8.1.3 IGF Code 5.5	
MI05.2	Verify operation of ventilation	IGF Code 13.5.1	
MI05.3	Visually inspect condition of double wall piping	IGF Code 9.6.1 CG-ENG Policy Ltr 01-12 Ch-1	
MI05.4	Witness alarm test for loss of pressurization between double wall piping	IGF Code 9.6.1.1	
MI05.5	Witness alarm test for loss of ventilation between double wall piping	IGF Code 9.6.1.2	

Verifying Officer Guidance: *Note: Trainee should be able to explain the difference between a gas safe machinery space and an ESD protected machinery space.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Machinery Equipment Inspection (MI)

LFF Fueled Vessels

Task: LFFMI-MI06 Inspect bilge system

Condition: *During machinery equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2017
 2. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
MI06.1	Identify segregated bilge system for location where fuel is present	IGF Code 5.9.1 IMO Res MSC.285(86) 2.8.4.5	
MI06.2	Witness operation of bilge well high level alarm	IGF Code 15.3.2 IMO Res MSC.285(86) 5.1.3	
MI06.3	Witness operation of bilge well low temperature alarm	IGF Code 15.3.2 IMO Res MSC.285(86) 5.1.3	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT01 Inspect bunkering station

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 3. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel
 4. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
FT01.1	Verify compliance with ventilation special consideration for other than open deck	IGF Code 8.3.1.1 IGF Code 13.7 IMO Res MSC.285(86) 2.9.1.1	
FT01.2	Verify piping	IGF Code 8.3.1.2 IMO Res MSC.285(86) 2.9.1	
FT01.3	Verify drip trays	IGF Code 8.3.1.3 IGF Code 5.10 IMO Res MSC.285(86) 2.9.1	
FT01.4	Verify pressure relief/liquid removal capabilities	IGF Code 8.3.1.4	
FT01.5	Witness testing of deck/hull shielding (water curtain)	IGF Code 8.3.1.5 IGF Code 8.3.1.6	
FT01.6	Verify arrangement of bunkering valves	IGF Code 8.5.3 IMO Res MSC.285(86) 2.9.2	
FT01.7	Verify manifold connections	IGF Code 8.4.1 CG-OES Policy Ltr 01-15 Encl. 1, p10	
FT01.8	Verify fuel schematic/piping & instrumentation diagram (P&ID)	IGF Code 18.4.2.2	
FT01.9	Verify manifold pressure indicator	IGF Code 15.4.7	
FT01.10	Verify ship-shore link (SSL)	IGF Code 8.5.7 IGF Code 18.4.4.4 CG-OES Policy Ltr 01-15 Encl. 1, p10	
FT01.11	Verify present of extinguisher	IGF Code 11.6.2	
FT01.12	Witness operation of manifold shutdown valves within allowed time	IGF Code 8.5.3 IGF Code 16.7.3.7	

Verifying Officer Guidance:

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT02 Inspect bunkering control location

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
FT02.1	Verify location and operation of monitoring equipment	IGF Code 15.5.1 IMO Res MSC.285(86) 2.9.1	
FT02.2	Verify presence of tank temperature gauge(s)	IGF Code 15.5.1 IGF Code 15.4.4 & .11 IMO Res MSC.285(86) 2.9.1	
FT02.3	Verify presence of water spray system pump & valve control(s)	IGF Code 15.5.1 IGF Code 11.5.7	
FT02.4	Verify presence of manually and automatic remote shutdown valve(s) in series or combined manually operated and remote valve(s)	IGF Code 15.5.1 IGF Code 8.5.3	
FT02.5	Verify operation of bunkering line ventilation failure audible and visual alarms	IGF Code 15.5.2	
FT02.6	Verify presence of gas detection audible and visual alarms	IGF Code 15.5.3 IMO Res MSC.285(86) 2.9.2	
FT02.7	Verify fuel schematic/piping & instrumentation diagram (P&ID)	IGF Code 18.4.2.2	

Verifying Officer Guidance:

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT03 Inspect fuel containment

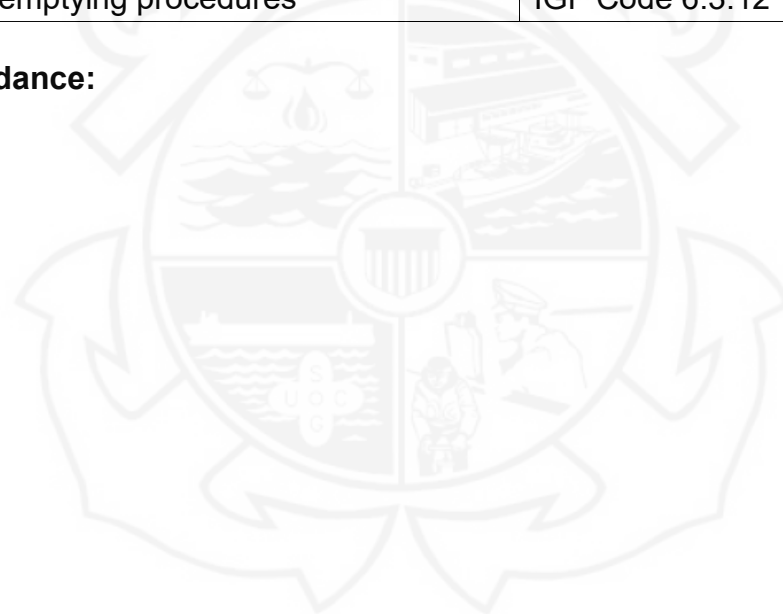
Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FT03.1	Verify Maximum Allowable Relief Valve Setting (MARVS)	IGF Code 6.3.1 IGF Code 6.6.2	
FT03.2	Verify Maximum Allowable Working Pressure (MAWP)	IGF Code 6.3.2 IGF Code 15.4.4	
FT03.3	Verify drip trays	IGF Code 6.3.10 IGF Code 5.10	
FT03.4	Verify means for emptying tanks	IGF Code 6.3.11	
FT03.5	Verify tank emptying procedures	IGF Code 6.3.12	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT04 Inspect fuel tank monitoring

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. IMO Resolution MSC.285(86) Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships

Steps		References	Initials
FT04.1	Verify liquid level gauge(s) arrangement	IGF Code 15.4.1	
FT04.2	Witness operational test of high liquid level alarm	IGF Code 15.4.2.1 IGF Code 15.4.2.3 IGF Code 15.4.2.4	
FT04.3	Witness operational test of automatic overfill prevention shutoff within allowed time	IGF Code 15.4.2.2 - .4 IGF Code 16.7.3.7 IMO Res MSC.285(86) 2.9.1-.2	
FT04.4	Verify presence of direct vapour space reading gauge	IGF Code 15.4.3 & .4	
FT04.5	Witness operational test of high & low-pressure alarms	IGF Code 15.4.5	
FT04.6	Verify presence of fuel pump discharge pressure indicator	IGF Code 15.4.4 & 15.4.6 IGF Code 15.4.8 IGF Code 15.4.9	
FT04.7	Witness operational test of low liquid level audible and visual alarm	IGF Code 15.4.10	
FT04.8	Witness operational test of low-low liquid level shutdown & audible and visual alarm	IGF Code 15.4.10	
FT04.9	Verify temperature measurement devices	IGF Code 15.4.11	

Verifying Officer Guidance: *Trainees should be aware that temperature measurement devices are not required for Type C insulated tanks with vacuum insulated systems and pressure build up fuel discharge units.*

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT05 Inspect pressure relief systems for LG fuel tanks

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
FT05.1	Verify pressure relief device on vacuum space of a vacuum insulated tank	IGF Code 6.7.2.1	
FT05.2	Verify a minimum of 2 pressure relief valves (PRVs) per fuel tank	IGF Code 6.7.2.2 IGF Code 6.7.2.5 IGF Code 6.7.2.13	
FT05.3	Verify interbarrier pressure relief devices	IGF Code 6.7.2.3	
FT05.4	Verify PRV settings	IGF Code 6.7.2.4	
FT05.5	Verify emergency isolation	IGF Code 6.7.2.6	
FT05.6	Verify venting system	IGF Code 6.7.2.7	
FT05.7	Verify other fuel gas vent outlet arrangements	IGF Code 6.7.2.9	
FT05.8	Verify means to drain liquid	IGF Code 6.7.2.10	
FT05.9	Verify vent screens	IGF Code 6.7.2.11	

Verifying Officer Guidance: *IGF Code 6.7.2.2 is not required on vessels applicable to interim guidelines.*

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT06 Inspect means of maintaining fuel storage condition

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FT06.1	Verify tank pressure & temperature control measures	IGF Code 6.9.1	
FT06.2	Verify operation of pressure and temperature control method(s)	IGF Code 6.9.1	
FT06.3	Verify secondary system availability	IGF Code 6.9.6.1	

Verifying Officer Guidance: *Thermal oxidizing system can be a gas consumer (ship's engine / boiler) or dedicated Gas Combustion Unit (GCU). See IGF Code 6.9.4 Availability means second system/method that, in the event of a single failure, it can be used to maintain pressure and temperature, which potentially can be a second main engine or aux generators that uses gas as fuel. See IGF 6.9.6.1.*

Inspector's Name: (Last, First, Initial)

EMPLID:

Verifying Officer's Signature:

Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT07 Inspect fuel containment system atmospheric controls

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FT07.1	Verify gas sampling points	IGF Code 6.10.3	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT08 Inspect inert gas system

Condition: *During machinery equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FT08.1	Verify continuous-reading oxygen content meter	IGF Code 6.14.1	
FT08.2	Verify set point of oxygen content by volume alarm	IGF Code 6.14.1	
FT08.3	Verify pressure controls & monitoring arrangements	IGF Code 6.14.2	
FT08.4	Verify nitrogen compartment ventilation	IGF Code 6.14.3	
FT08.5	Witness test of low oxygen in compartment alarm, if system is located outside the engine room	IGF Code 6.14.3	
FT08.6	Verify installation of backflow prevention	IGF Code 6.13.1	
FT08.7	Witness test of low oxygen on the nitrogen system oxygen content analyzer	IGF Code 6.14.3	
FT08.8	Verify nitrogen compartment ventilation & test low oxygen alarm	IGF Code 6.14.3	

Verifying Officer Guidance: *IGF Code does not reference the FSS Code for inert gas systems. External atmospheric control gas may be used per 6.10.*

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT09 Inspect fuel piping

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. ISO 14726:2008 Ships & Marine Technology - Identification Colours for the Content of Piping Systems

Steps		References	Initials
FT09.1	Verify color markings	IGF Code 7.3.1.1 ISO 14726	
FT09.2	Verify electrical bonding	IGF Code 7.3.1.2 IGF Code 18.4.5	
FT09.3	Verify relief valves	IGF Code 7.3.1.3	
FT09.4	Verify thermal insulation	IGF Code 7.3.1.4	
FT09.5	Verify installation	IGF Code 9.2.2 IGF Code 9.2.3	
FT09.6	Verify purging arrangements	IGF Code 7.2.1.3	
FT09.7	Verify special consideration through Ro-Ro spaces	IGF Code 11.3.5	

Verifying Officer Guidance: *If repair was conducted, refer to table 7.1 of IGF Code.*

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT10 Inspect safety functions of gas & fuel supply system

Condition: *During machinery equipment inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FT10.1	Verify automatic operation of storage tank valves	IGF Code 9.4.1 IGF Code 16.7.3.6	
FT10.2	Witness operation of master gas fuel valve	IGF Code 9.4.2 IGF Code 9.4.3 IGF Code 9.4.7	
FT10.3	Witness operation test of double block and bleed valves arrangement	IGF Code 9.4.4 IGF Code 9.4.5 IGF Code 9.4.9	
FT10.4	Verify operation of manual shutdown valve	IGF Code 9.4.8	
FT10.5	Verify rupture detection system & location/operation of shutoff valve	IGF Code 9.4.10	
FT10.6	Verify condition of secondary piping enclosure outside machinery space	IGF Code 9.5	
FT10.7	Verify condition of secondary piping enclosure in gas-safe machinery space	IGF Code 9.6	
FT10.8	Verify automatic shutdown signage	IGF Code 15.11.1	
FT10.9	Verify fuel supply shutdown signage	IGF Code 15.11.2	
FT10.10	Verify heavy lifting signage	IGF Code 15.11.3	

Verifying Officer Guidance:

Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT11 Inspect gas detection system

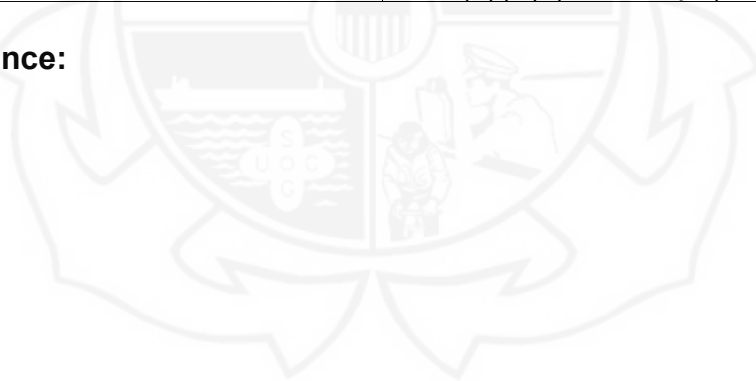
Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems
 3. International Electrotechnical Commission (IEC) 60079-29-1 Gas Detectors - Performance Requirements of Detectors for Flammable Gases

Steps		References	Initials
FT11.1	Verify gas detector installation(s)	IGF Code 15.8.1 IGF Code 15.8.3 & .8 CG-ENG Policy Ltr 01-12 Ch-1, 15.8(b)	
FT11.2	Verify equipment meets recognized standard	CG-ENG Policy Ltr 01-12 Ch-1, 15.8(b) IEC 60079-29-1	
FT11.3	Verify alarm set points	IGF Code 15.8.6-.9 CG-ENG Policy Ltr 01-12 Ch-1 15.8	
FT11.4	Witness operational test of equipment	IGF Code 15.8.5 & .9	
FT11.5	Verify operation of independent power sources for gas detection	CG-ENG Policy Ltr 01-12 Ch-1, 15.8(e)(vi) (Encl. 1, p9)	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Fuel Transfer System Inspection (FT)

LFF Fueled Vessels

Task: LFFMI-FT12 Inspect system redundancy

Condition: *During the inspection of the fuel transfer system*

Standard: *In compliance with applicable policies, laws, regulations and standards*

References: 1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016

Steps		References	Initials
FT12.1	Verify operation of redundant system for single fuel installation	IGF Code 9.3.1 IGF Code 9.3.2	
FT12.2	Verify operation of redundant system for Type C tank installation	IGF Code 9.3.3	

Verifying Officer Guidance: *There are currently no single fueled engines in US domestic fleet.*



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Electrical Systems Inspection (ES)

LFF Fueled Vessels

Task: LFFMI-ES01 Inspect hazardous areas

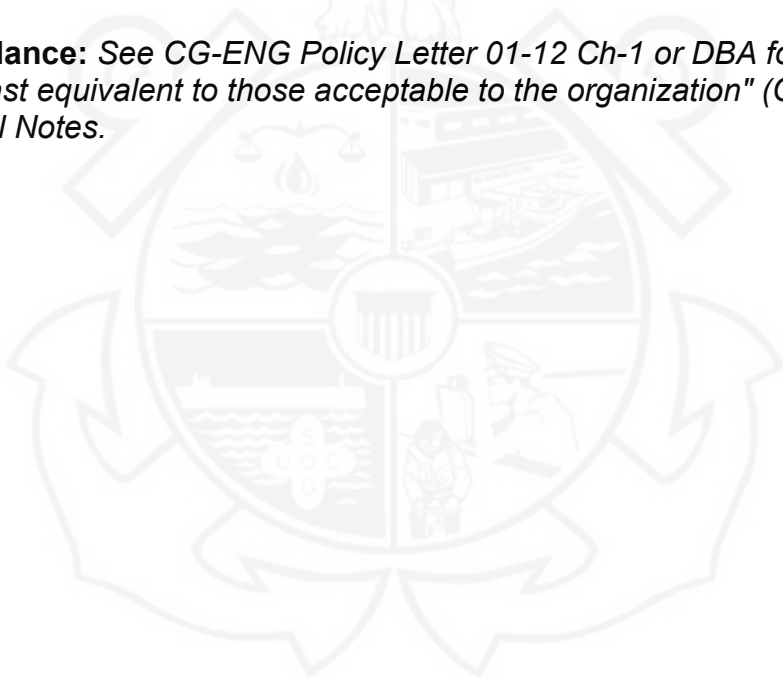
Condition: *During electrical system inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
ES01.1	Verify hazardous area classification(s)	IGF Code 12.3, .5 CG-ENG Policy Ltr 01-12 Ch-1	
ES01.2	Verify conditions of electrical equipment installation	IGF Code 12.3 IGF Code 14.3.3	

Verifying Officer Guidance: See CG-ENG Policy Letter 01-12 Ch-1 or DBA for "recognized standard" that is "at least equivalent to those acceptable to the organization" (CFR, NFPA, IEC); see vessel's MISLE Special Notes.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Electrical Systems Inspection (ES)

LFF Fueled Vessels

Task: LFFMI-ES02 Inspect low - low liquid alarm & shutdown

Condition: *During electrical system inspection*

Standard: *In compliance with applicable policies, laws, regulations and standards*

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
ES02.1	Witness operation of motor shutdown	IGF Code 14.3.7	
ES02.2	Witness operation of alarms and indicator(s)	IGF Code 14.3.7	
ES02.3	Verify means of locking submerged pump circuit breaker	CG-ENG Policy Ltr 01-12 Ch-1 Encl. 1, p 8	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Emergency Drills (ED)

LFF Fueled Vessels

Task: LFFMI-ED01 Verify drills are conducted

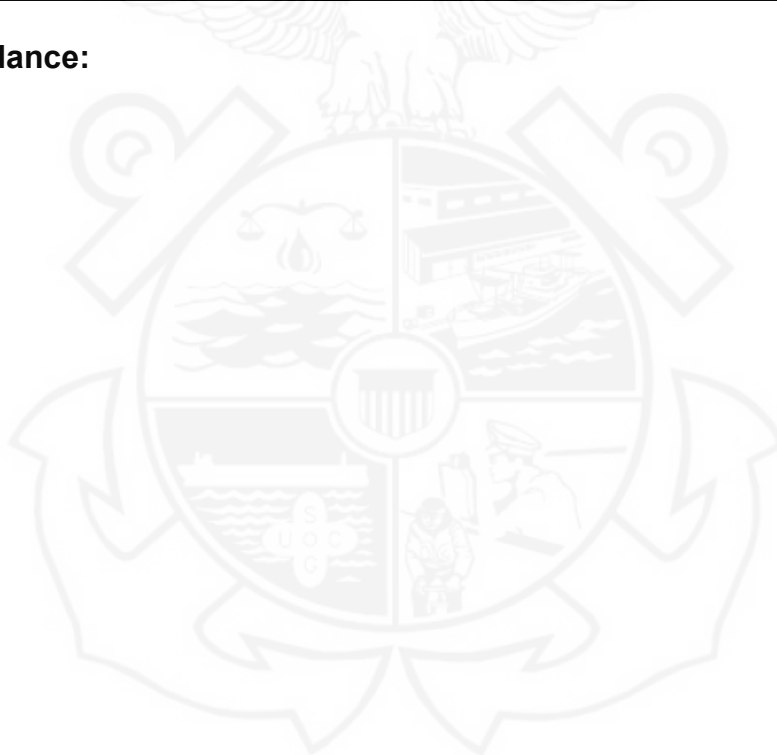
Condition: While validating logs and manuals

Standard: In compliance with applicable policies, laws, regulations and standards

- References:**
1. International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), 2016
 2. CG-OES Policy Letter 01-15 Guidelines for Liquefied Natural Gas Fuel Transfer Operations & Training of Personnel on Vessels Using Natural Gas as Fuel

Steps		References	Initials
ED01.2	Witness gas related ship specific drills	IGF Code 17 CG-OES 01-15 (Chapter 5.3)	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Follow Up Actions (FU)

LFF Fueled Vessels

Task: LFFMI-FU01 Complete MISLE Activity

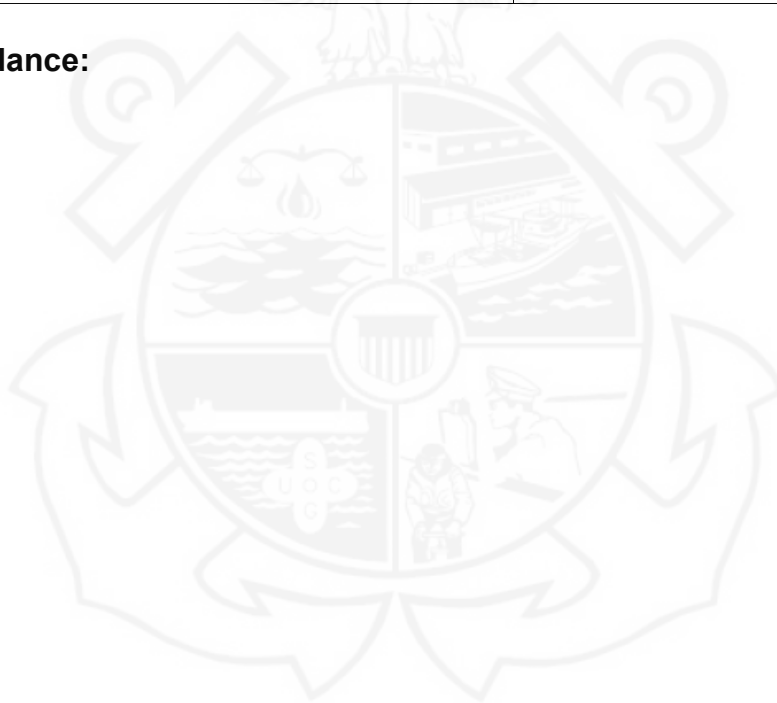
Condition: *Upon completion of the inspection*

Standard: *In accordance with current policies, procedures and processes*

References: 1. Marine Information for Safety & Law Enforcement (MISLE 5.0) Vessels User Guide

Steps		References	Initials
FU01.1	Ensure Propulsion System Type indicates Dual Fuel (Diesel & Liquefied Gas)	MISLE User Guide	
FU01.2	Enter alternative design into Special Notes	MISLE User Guide	
FU01.3	Enter system configuration into Special Notes	MISLE User Guide	
FU01.4	Enter tank type into Special Notes	MISLE User Guide	

Verifying Officer Guidance:



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

Follow Up Actions (FU)

LFF Fueled Vessels

Task: LFFMI-FU02 Complete Deficiency Write-up

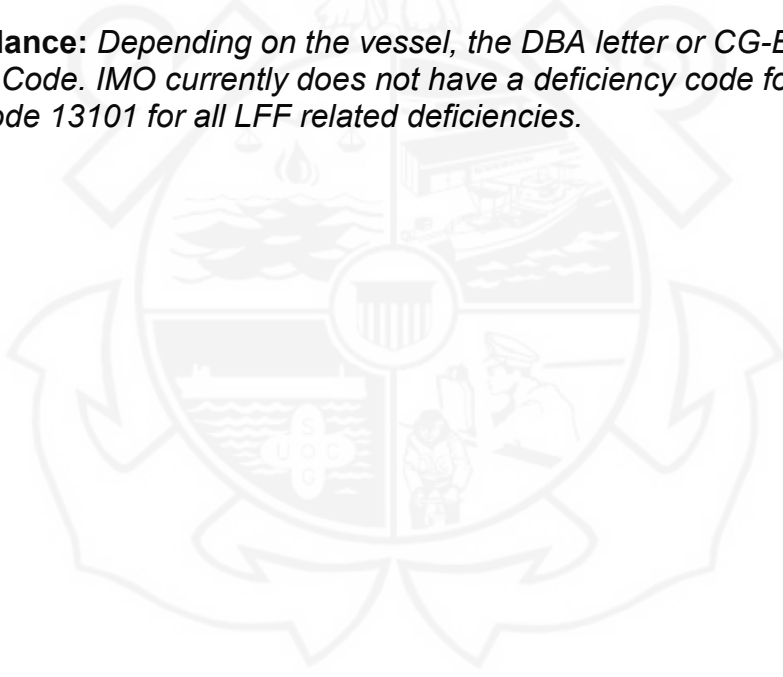
Condition: Upon completion of the inspection

Standard: In accordance with current policies, procedures and processes

- References:**
1. Marine Information for Safety & Law Enforcement (MISLE 5.0) Vessels User Guide
 2. Design Basis Agreement Letter
 3. CG-ENG Policy Letter 01-12 Ch-1 Equivalency Determination - Design Criteria for Natural Gas Fuel Systems

Steps		References	Initials
FU02.1	Enter deficiency into MISLE using MISLE Code 13101 or 13102	MISLE User Guide Design Basis Agreement Letter CG-ENG Policy Ltr 01-12 Ch-1	

Verifying Officer Guidance: Depending on the vessel, the DBA letter or CG-ENG Policy Letter leads to incorporation of IGF Code. IMO currently does not have a deficiency code for LFF, for better data capture, use MISLE Code 13101 for all LFF related deficiencies.



Inspector's Name: (Last, First, Initial)	EMPLID:
Verifying Officer's Signature:	Date:

**Performance Qualification Standard and Job Aid Change
Recommendation Form**

From: _____ Date: _____

PQS/Job Aid Title:

Section(s) Affected:

Remark(s)/Comment(s):

Reference(s):

Signature: _____

Submit to MarineSafetyPQS@uscg.mil by clicking the button