



LGC NCOE Field Notice 02-2016
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MEMORANDUM

From: J. E. Smith, CDR

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To: Distribution

Subj: DOMESTIC VESSEL LNG FUEL SYSTEM INSPECTION JOB AID

Ref: (a) CG-OES Policy Letter 01-15 – Guidance for Liquefied Natural Gas Fuel Transfer Operations and Training of Personnel on Vessels using Natural Gas as Fuel
(b) CG-521 Policy Letter 01-12 – Equivalency Determination – Design Criteria for Natural Gas Fuel Systems
(c) MSC. 285 (86) – Interim Guidelines on Safety for Natural Gas-Fuelled Engine Installations in Ships
(d) IGF Code - International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels

1. In April 2015, the USCG Liquefied Gas Carrier (LGC) National Center of Expertise (NCOE) identified the need for and with USCG Headquarters program support established the LNG as a Fuel Workforce Development Committee (LNGFWDC) to identify USCG prevention workforce development needs for the emerging use of LNG as a maritime fuel and LNG bunkering. The LGC NCOE recruited over 40 field and staff subject matter experts (SME) comprised of experienced LNG facility inspectors, marine inspectors, and gas carrier examiners from around the nation as members of the LNGFWDC. The SMEs were divided into two sub-committees, one for LNG fueled vessels and one for LNG bunkering facilities. These groups have identified the highest priority workforce needs and will collectively develop draft deliverables to be used as recommendations for field units. The LGC NCOE is disseminating these recommendations as field notices for local units and industry to utilize on current and proposed projects and for USCG Headquarters program offices to consider as field tested templates.

2. Over the last several months the LNGFWDC LNG as fuel sub-committee has identified the need for a LNG fuel system inspection checklist for domestic LNG fueled vessels as their highest priority. Throughout this timeframe several members of the team inspected and witnessed the operation of LNG fuel systems onboard vessels in port and underway. The LNG as fuel sub-committee used this information along with references (a), (b), (c), and (d) to develop their first deliverable found in Encl (1): Domestic Vessel LNG Fuel System Inspection Job Aid. As such, it is merely a compilation of these references, and does not create new requirements or policy.

3. The Domestic Vessel LNG Fuel System Inspection Job Aid has been field tested onboard vessels using LNG as fuel in the U.S. by local field units and the LNGFWDC. The job aid can be used for initial and annual inspections, and Periodic Safety Test Procedures (PSTPs) of LNG fuel systems used onboard domestic vessels using LNG as fuel.

4. Through the LGC NCOE, the LNGFWDC has also recently released a LNG Bunkering Job Aid for facility to ship operations. The LNGFWDC is currently developing a LNG Bunkering Job Aid for vessel to vessel LNG bunkering operations and pre-commissioning fuel system job aid. Additionally the working group is considering a need for a Foreign Vessel LNG Fuel System Inspection Job Aid and other workforce development documents to best prepare the Coast Guard for the growing use of LNG as a maritime fuel.

5. Comments or questions regarding this job aid should be directed to the LGC NCOE's Liquefied Gas as Fuel SME and new Chair of the LNG as fuel sub-committee, Mr. Scott Mercurio who can be reached by email at Scott.Mercurio@uscg.mil or by phone at 409-723-6508.

Encl: Domestic Vessel LNG Fuel System Inspection Job Aid

Dist: Sector Prevention Departments Chiefs
Sector Inspection Divisions Chiefs
Port State Control Branch Chiefs
Sector Marine Inspection Training Officers
District (p)
Area (p)
CG-5P-TI
CG-ENG
CG-FAC
CG-OES
CG-CVC
MSC

DOMESTIC VESSEL LNG FUEL SYSTEM INSPECTION JOB AID

Name of Vessel: _____ IMO or Official Number: _____

Type of Inspection: _____ Date of Inspection: _____

Type of Vessel: _____

Y = Yes N = No N/A = Item does not apply C = Corrected on the spot PSTP = Periodic Safety Test Procedure ₁						Regulatory Cites/ USCG Guidance
	PSTP	Y	N	N/A	C	
1. Documentation						MSC.285(86) 8.3 IGF Code 3.2.17, 18.2 and 18.3 CG-OES Policy Letter 01-15
A. Operations Manual	N/A					
1. Review Periodic Safety Test Procedures (PSTPs)	N/A					
2. Review Engine/Deck log books for PSTP checks	N/A					
B. Class Docs for fuel system	N/A					
C. Conditions of Class, etc.	N/A					
D. Gas Detection Servicing Doc	N/A					
E. Check frequency of all safety devices, servicing of	N/A					
F. Fire system servicing docs	N/A					
G. Crew training, licensing, endorsements	N/A					
1. Crew	N/A					MSC.285(86) 8.2.1.1
2. Deck officers	N/A					MSC.285(86) 8.2.1.2
3. Engineer officers	N/A					MSC.285(86) 8.2.1.2
2. Instrumentation and Safety System Checks						To include all safety system checks for all inspected systems
A. Spot check PSTPs per OPS Manual						
3. Bunkering Manifold						MSC.285(86) 2.9 and 2.9.2 IGF Code 8 and 15.5
A. Valves	N/A					
1. Shutdown valves (ESD)/Stop valves actuation closes in 30 sec or less	N/A					IGF Code 8.5.8 – See Ops Manual for closing time
a. Manual operation	N/A					MSC.285(86) 2.9.2.2
b. Remote operation	N/A					IGF Code 8.5.3
B. Pressure gauges	N/A					MSC.285(86) 5.1.1

LNG Fuel System Inspection Job Aid

	PSTP	Y	N	N/A	C	
						IGF Code 15.3.1
C. Dry Powder Fire Fighting	N/A					MSC.285(86) 3.3.3 IGF Code 11.6 CG-521 Policy Letter 01-12/3.3.3
D. Spill Protection	N/A					IGF Code 8.3.1.5 CG-OES Policy Letter 01-15
1. Water Curtain	N/A					Approved Vessel Transfer Procedure
2. Drip Trays	N/A					MSC.285(86) 2.9.1.2 IGF Code 5.10
E. Intrinsically safe electrical equipment	N/A					MSC.285(86) 4.1 IGF Code 14.3 CG-521 Policy Letter 01-12/4.1(2)
1. Ship-shore link	N/A					MSC.285(86) 2.9.1.3 IGF Code 8.5.7
2. Gas Detection	N/A					MSC.285(86) 2.9.2.3 and 5.5 IGF Code 15.5.3 and 15.8 CG-521 Policy Letter 01-12/5.5
3. Fire Detection	N/A					MSC.285(86) 3.4 IGF Code 11.7 CG-521 Policy Letter 01-12/3.4
4. Lighting	N/A					MSC.285(86) 4.1 IGF Code 14.3.5 GC-OES Policy Letter 01-15 CG-521 Policy Letter 01-12
5. Electrical remote valve indicators	N/A					MSC.285(86) 4.1 IGF Code 14
4. Airlocks						MSC.285(86) 2.4.1 (Ref IGC Code 3.6) IGF Code 5.12 CG-521 Policy Letter 01-12/2.4
A. Mechanical Ventilation	N/A					MSC.285(86) 2.10.1.9 IGF Code 13.3.9 and 13.3.10 CG-521 Policy Letter 01-12/2.10.1
1. Loss of overpressure ventilation	N/A					MSC.285(86) 2.10.1.9.3 IGF Code 13.3.9.2 and 15.10
B. Audible/Visual Alarms	N/A					IGF Code 5.12.5
C. Gas Detection	N/A					MSC.285(86) 5.5 IGF Code 15.8 CG-521 Policy Letter 01-12/5.5
D. Intrinsically Safe Lighting	N/A					IGF Code 14.3
E. Inspect self closing door mechanism	N/A					MSC.285(86) 2.4.5
5. Tank Space/Semi-Enclosed Area						MSC.285(86) 2.3.4
A. Gastight boundary doors	N/A					MSC.285(86) 2.3.4.1
B. Intrinsically safe electrical	N/A					MSC.285(86) 4.1

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	PSTP	Y	N	N/A	C	
equipment						IGF Code 14.3
1. Gas detection	N/A					MSC.285(86) 5.5 IGF Code 15.8 CG-521 Policy Letter 01-12/5.5
2. Fire Detection	N/A					MSC.285(86) 3.4.1 and 3.4.2, Table 1 Ch 5 IGF Code 11.7 and 15.9 Table 1 CG-521 Policy Letter 01-12/3.4.1
3. Lighting	N/A					MSC.285(86) 4.1 IGF Code 14.3.5 GC-OES Policy Letter 01-15 CG-521 Policy Letter 01-12
C. Water spray system (Tanks located above deck)	N/A					MSC.285(86) 3.3.2 IGF Code 11.5 CG-521 Policy Letter 01-12/3.3.2
D. Mechanical ventilation – Negative (under) pressure	N/A					MSC.285(86) 2.10.2 IGF Code 13.4 CG-521 Policy Letter 01-12/2.10.2
E. Bilge wells	N/A					MSC.285(86) 5.1.3 IGF Code 15.3.2
1. Temperature sensor/alarm	N/A					IGF Code 15.3.2
2. Bilge high level alarm	N/A					IGF Code 15.3.2
3. Bilge suction	N/A					MSC.285(86) 2.8.4.5
6. Fuel Tanks						MSC.285(86) 2.8 and 5.2 IGF Code 6
A. Liquid level gauging						MSC.285(86) 5.2.1 (Ref IGC Code 13.2 and 13.3) IGF Code 15.4.1, 15.4.2, and 15.5
1. High level alarm						MSC.285(86) 5.2.1 (Ref IGC Code 13.3) IGF Code 15.4.2.1
2. Overfill alarm						MSC.285(86) 5.2.1 (Ref IGC Code 13.3) IGF Code 15.4.2.2
B. Shutoff valves inlet/outlet	N/A					MSC.285(86) 5.6 IGF Code 9.4
1. Automatic closing when safety system is activated	N/A					MSC.285(86) 5.2.1 (Ref IGC Code 13.3) IGF Code 9.4.1, 15.4.2.2, and 15.5.1
C. Tank pressure sensors – high pressure and vacuum						MSC.285(86) 5.2.2 IGF Code 15.4.3, 15.4.4, 15.4.5, and 15.5.1
1. Local indicating device	N/A					
2. Remote indicating device	N/A					
D. Pressure relief valves/MARVS	N/A					IGF Code 6.7.2
1. Visually inspect pilot valve	N/A					Verify bench test as per ops

LNG Fuel System Inspection Job Aid

PSTP Y N N/A C

	PSTP	Y	N	N/A	C	
	N/A					manual/service document
E. Tank temperature sensors						IGF Code 6.9.1
F. Visual inspection of supports/mounts/tank externals	N/A					MSC. 285 (86) 2.8 IGF Code 6.4.15
G. Verify annular space vacuum						CG-521 Policy Letter 01-12/2.8
7. Submerged cargo pumps						CG-521 Policy Letter 01-12/4.1(4)
A. Low liquid level, low current, low discharge pressure shutdown						IGF Code 14.3.7 and 14.3.8 Test shut downs/alarms
B. Audible/visual alarm						
C. Lockable circuit breaker or switch						
8. Vaporizer Space/Cold Box						IGF Code 5.8
A. Intrinsically safe electrical equipment	N/A					MSC.285(86) 4.1 IGF Code 14.3 CG-521 Policy Letter 01-12/4.1(2)
1. Gas detection	N/A					MSC.285(86) 5.5 IGF Code 15.8 CG-521 Policy Letter 01-12/5.5
2. Fire detection	N/A					MSC.285(86) 3.4.2, Table 1 Ch 5 IGF Code 11.7 and 15.9 Table 1 CG-521 Policy Letter 01-12/3.4.1
3. Lighting	N/A					MSC.285(86) 4.1 IGF Code 14.3.5 GC-OES Policy Letter 01-15 CG-521 Policy Letter 01-12
4. Instrumentation	N/A					MSC.285(86) 5.1
B. Fire protection	N/A					MSC.285(86) 3.1 IGF Code 11.3.1
C. Mechanical ventilation – Negative (under) pressure	N/A					MSC.285(86) 2.10.4 IGF Code 13.6
D. Master Gas Valve	N/A					MSC.285(86) 5.6
1. Automatic closing when safety system is activated	N/A					IGF Code 9.4 and 9.4.2, See IGF Code Table 1: Monitoring of gas supply system to engines
E. Vaporizer glycol system	N/A					Vessel Operations Manual
9. Compressor Room/Cold Box						MSC.285(86) 6.1 IGF Code 9.9
A. Intrinsically safe electrical equipment	N/A					MSC.285(86) 4.1 IGF Code 14.3 CG-521 Policy Letter 01-12/4.1(2)
1. Gas detection	N/A					MSC.285(86) 5.5 IGF Code 15.8 CG-521 Policy Letter 01-12/5.5
2. Fire detection	N/A					MSC.285(86) 3.4.2, Table 1 Ch 5 IGF Code 11.7 and 15.9 Table 1 CG-521 Policy Letter 01-12/3.4.1

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	PSTP	Y	N	N/A	C	
3. Lighting	N/A					MSC.285(86) 4.1 IGF Code 14.3.5 GC-OES Policy Letter 01-15 CG-521 Policy Letter 01-12
B. Fire protection	N/A					MSC.285(86) 3.1 IGF Code 11.3.1
C. Mechanical ventilation – Negative (under) pressure	N/A					MSC.285(86) 2.10.4 IGF Code 13.6
D. Compressor monitoring system – to include high and low temp and pressure alarms, etc.						MSC.285(86) 6.1 and 5.3 IGF Code 9.9 and 15.6.1 CG-521 Policy Letter 01-12/5.3
E. Gas tight bulkhead/deck shaft glands						MSC.285(86) 2.3.2.2 IGF Code 9.9.1 and 15.6.2
10. Gas Piping System						MSC.285(86) 2.7, 2.9.3 and 5.6 IGF Code 9.4, 9.5, 9.6, 9.7
A. Secondary enclosures	N/A					IGF Code 9.5.1
1. Ventilated duct	N/A					MSC.285(86) 2.9.3.2 IGF Code 9.6.1.2 and 13.8
a. Negative ventilation	N/A					
2. Double wall piping	N/A					MSC.285(86) 2.7.1.1.2 IGF Code 9.6.1.1 and 13.8
a. Continuous nitrogen purge	N/A					
B. Gas detection	N/A					MSC.285(86) 5.5 IGF Code 15.8 CG-521 Policy Letter 01-12/5.5
C. Ventilation/purge failure/loss of pressure alarms						MSC.285(86) 2.10.1.3 and 2.10.1.4 IGF Code 15.10
D. Pressure gauges	N/A					MSC.285(86) 5.1.2 IGF Code 15.3.1
11. Gas Detection, Installed						MSC.285(86) 5.5
A. Calibration	N/A					IGF Code 15.8
B. Span gas	N/A					CG-521 Policy Letter 01-12/5.5 Per Vessel Operations Manual and/or manufacturer's instructions
1. Gas type/mix	N/A					
2. Expiration	N/A					
C. Spaces serviced	N/A					MSC.285(86) 5.5.1 IGF Code 15.8.1
D. Alarm locations	N/A					MSC.285(86) 5.5.5 IGF Code 15.8.8 CG-521 Policy Letter 01-12/5.5(2)
E. Gas Detection, Spaces Alarms/Shutdowns	N/A					MSC.285(86) 5.5.4 IGF Code 15.8.6
1. 20% LEL audible/visual alarms	N/A					CG-521 Policy Letter 01-12/5.6
2. 40% LEL safety system activation	N/A					Table 2
F. Gas Detection, Vent ducts/hoods	N/A					MSC.285(86) 5.5.4
1. 30% LEL alarm	N/A					IGF Code 15.8.7
2. 60% LEL safety system	N/A					CG-521 Policy Letter 01-12/5.6

LNG Fuel System Inspection Job Aid

PSTP Y N N/A C

	PSTP	Y	N	N/A	C	
activation						Table 2
12. Gas Detection, Portable						IGF Code 18.5.1 CG-OES Policy Letter 01-15 CG-521 Policy Letter 01-12/5.5(6) Per Vessel Operations Manual and/or manufacturer's instructions
A. Calibration	N/A					
B. Span gas	N/A					
1. Gas type/mix	N/A					
2. Expiration	N/A					
C. Proof of proper operation	N/A					
13. Nitrogen Generator/Storage						Per Vessel Operations Manual and/or manufacturer's instructions
A. O2 Alarm						
B. Constant flow/purge						
14. Gas switching interlocks						MSC.285(86) 2.6.2.2, 2.6.3, 6.3, and 6.4 IGF Code 5.6.3.3, 10.3.2, 10.3.3, 10.3.4, 10.4.4 Note: Engine/deck/alarm logs/loss of propulsion, etc.
A. Low/high pressure gas shut down/fuel switching						
B. Low maneuvering speeds gas shut down/fuel switching						
C. Gas fuel system ESD/safety system shutdown/fuel switching						
15. Electrical bonding						MSC.285(86) 2.5.23, 2.10.1.2.4 IGF Code 7.3.1.2, 14.3.6, 18.4.5 CG-521 Policy Letter 01-12/4.1(7) CG-OES Policy Letter 01-15
A. Valves	N/A					
B. Piping systems	N/A					
C. Pumps	N/A					
D. Ventilation systems	N/A					
16. Personnel Protective Equipment						CG-OES Policy Letter 01-15
A. Cryogenic Protective Equipment	N/A					
1. Gloves	N/A					
2. Full face shields	N/A					
3. Fit-for-purpose clothing	N/A					
4. Protective foot wear	N/A					
5. Hard hats	N/A					

Footnotes

1. Perform PSTP checks per vessel operations manual.