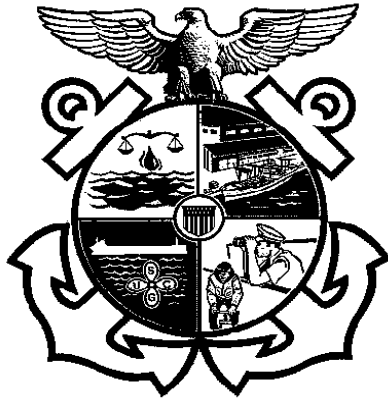


United States Coast Guard



FOREIGN GAS CARRIER EXAMINER COMPETENCY CODE (FGCE)

Training Aid

Training Aid FGCE
Rev. Dec 2017

DCN: MPS-TA-TCY-FGCE(D)

Use of Foreign Gas Carrier Examiner Training Aid:

This is a condensed version of the FGC Examiner Performance and Qualification Standard (PQS) workbook. This Training Aid is intended to be used by Coast Guard Foreign Gas Carrier Examiner trainees during examinations of foreign flagged vessels subject to Port State Control. This Training Aid provides a quick reference for all the steps necessary to complete specific examination tasks listed in the FGCE Job Aid.

This Training Aid cites SOLAS regulations from the 2014 Consolidated Edition (SOLAS 14). In some cases, the regulations in SOLAS 14 may not apply due to the keel laid date of the vessel. PSC personnel must pay close attention to the applicability dates of the SOLAS chapters and regulations when conducting PSC exams.

Table of Contents:

Foreign Gas Carrier Examination

Pre-exam	1
Certificates and Documents	1
Logs and Manuals	3
General Health & Safety	4
Lifesaving Equipment	6
Firefighting Systems	6
Electrical Systems	7
Instrumentation	8
Cargo Systems	9
Cargo Environmental Control	10
Cargo Area Ventilation System	11
Gas Fuel Supply System	11
Follow Up Action	12

Pre-Exam (PE)

FGCE-PE01 - Prepare Certificate of Compliance (COC) for issuance

.01 Prepare certificate	MPS-PR-SEC-04
.02 Attach most recent Subchapter "O" Endorsement to certificate	46 CFR 154.1802(a)(1)
.03 Forward COC with Subchapter "O" Endorsement to OCMI or designated representative for signature	MSM II/D.6.E

Pre-Exam (PE)

FGCE-PE02 - Conduct safety meeting

.01 Verify examination team is outfitted with appropriate PPE	MSM I/10.D.5.a MSM I/ 8.A.3
.02 Verify examination team is outfitted with atmospheric monitors	MSM I/10.D.5.b
.03 Verify examination team is outfitted with Emergency Escape Breathing Device (EEBD)	MSM I/10.D.5.d
.04 Determine if a marine chemist is required to certify the cargo machinery space	MSM II/D.6.C.1.f CG-543 Safety Alert
.05 Ensure examination team is aware of safety hazards associated with cargo(s) presence	MSM I/10.C.1.a Tanker Safety Guide

Certificates and Documents (CD)

FGCE-CD01 - Examine International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk

.01 Verify validity	MARPOL II/5.3.2 MARPOL II/10
.02 Verify issued by administration or recognized organization	MARPOL II/5.3.2 MARPOL II/9.2
.03 Verify NLS cargo being carried is authorized	MARPOL II/5.3.2 MARPOL II/Appendix III
.04 Verify intermediate survey has been completed	MARPOL II/5.3.2 MARPOL II/8.1.3
.05 Verify annual survey has been completed	MARPOL II/5.3.2 MARPOL II/8.1.4

Certificates and Documents (CD)

FGCE-CD02 - Examine International Certificate of Fitness (COF) for the Carriage of Liquefied Gases in Bulk (IGC Code)

.01 Verify validity	IGC (2016) 1.4.4 IGC (2016) 1.4.6
.02 Verify issued by administration or recognized organization	IGC (2016) 1.4.4 IGC (2016) 1.4.5
.03 Verify cargoes are authorized	IGC (2016) 18.4.1
.04 Verify that any alternative arrangements or equivalencies are identified	IGC (2016) 1.3 & 1.4.4.4.3 IGC (2016) 2.6.2 IGC (2016) Appendix
.05 Verify intermediate survey has been completed	IGC (2016) 1.4.2.3
.06 Verify annual survey has been completed	IGC (2016) 1.4.2.4

Certificates and Documents (CD)

FGCE-CD03 - Examine the Certificate of Fitness (COF) for the Carriage of Liquefied Gases in Bulk (GC Code)

- | | | |
|-----|---|---|
| .01 | Verify validity | GC Code Appendix
GC Code 1.6.3
EGC Code |
| .02 | Verify issued by administration or recognized organization | GC Code 1.6.4 |
| .03 | Verify cargoes are authorized | GC Code 18.2.1 |
| .04 | Verify any alternative arrangements or equivalencies are identified | GC Code 1.5 & 1.6.3(a)
GC Code 2.7.2 |
| .05 | Verify intermediate survey has been completed | GC Code Appendix
GC Code 1.6.1(c) |
| .06 | Verify annual survey has been completed | GC Code 1.6.1(d) |

Certificates and Documents (CD)

FGCE-CD04 - Examine Certificate of Fitness (COF) for the Carriage of Liquefied Gases in Bulk (EGC Code)

- | | | |
|-----|---|--|
| .01 | Verify validity | GC Code 1.6.3(a)
GC Code 1.6.5 & GC Appendix
IMO Res A.329(IX) |
| .02 | Verify issued by administration or recognized organization | GC Code 1.6.4 |
| .03 | Verify cargoes are authorized | GC Code 18.2.1 |
| .04 | Verify any alternative arrangements or equivalencies are identified | GC Code 1.5 & 1.6.3(a)
GC Code 2.7.2 |
| .05 | Verify intermediate survey has been completed | GC Code Appendix
GC Code 1.6.1(c) |
| .06 | Verify annual survey has been completed | GC Code 1.6.1(d) |
| .07 | Identify any aspects of vessel that do not comply with the EGC Code | EGC 1.2.3(b)
MSM II/F.4.C |

Certificates and Documents (CD)

FGCE-CD05 - Verify documentation of allowable loading limits and maximum loading reference temperatures for each product carried onboard

- | | | |
|-----|--|-----------------------------------|
| .01 | Verify data is approved by administration | IGC (2016) 15.6.1
GC Code 15.2 |
| .02 | Verify data includes Maximum Allowable Relief Valve Settings (MARVS) of pressure relief valves | IGC (2016) 15.6.2
GC Code 15.2 |

Certificates and Documents (CD)

FGCE-CD06 - Examine documentation applicable to changing and setting of cargo tank pressure relief valves

- | | | |
|-----|--|---|
| .01 | Examine documentation from administration attesting to proper settings of pressure relief valves | IGC (2016) 8.2.6
GC Code 8.2.5 |
| .02 | Verify procedures for changing cargo tank set pressures are approved by the administration | IGC (2016) 8.2.8
IGC (2016) 18.2.2.10
GC Code 8.2.7 |
| .03 | Verify changes to cargo tank set pressures are logged | IGC (2016) 8.2.8
GC Code 8.2.7 |

Certificates and Documents (CD)**FGCE-CD07 - Examine crew training documentation**

- | | |
|---|--|
| .01 Verify individuals with duties and responsibilities related to cargo or cargo equipment holds proper certificates | STCW V/1-2.1 |
| .02 Verify individuals with immediate responsibility for cargo related operations holds proper certificate | STCW V/1-2.3 |
| .03 Verify crew holds certificates of proficiency | STCW V/1-2.5
STCW V/1-2.2
STCW V/1-2.4 |

Certificates and Documents (CD)**FGCE-CD08 - Examine Subchapter "O" Endorsement (SOE)**

- | | |
|--|---|
| .01 Verify IMO International Gas Code COF matches current COF | 46 CFR 154.1802(1)
MSC Guidelines C1-43 |
| .02 Verify cargo containment system(s) is identified on SOE | 46 CFR 154.1802(1)
MSC Guidelines C1-43 |
| .03 Verify safety relief valves (MARVS) are set according to SOE | 46 CFR 154.1802(1)
MSC Guidelines C1-43
CG-ENG Policy Ltr 04-12 |
| .04 Verify authorized cargo(s) are on International Gas Code COF | 46 CFR 154.1802(1)
MSC Guidelines C1-43 |
| .05 Verify compliance with any special restrictions | 46 CFR 154.1808
MSC Guidelines C1-43 |

Certificates and Documents (CD)**FGCE-CD09 - Examine Certificate of Inhibition**

- | | |
|--|---|
| .01 Verify name of Inhibitor | IGC (2016) 17.8.1
GC Code 17.10 (a)
46 CFR 154.1818(b)(1) |
| .02 Verify amount of inhibitor added to the cargo(es) | IGC (2016) 17.8.1
GC Code 17.10 (a)
46 CFR 154.1818(b)(1) |
| .03 Verify date inhibitor was added | IGC (2016) 17.8.2
GC Code 17.10 (b)
46 CFR 154.1818(b)(2) |
| .04 Verify expected duration of inhibitor's effective lifetime | IGC (2016) 17.8.2
GC Code 17.10 (b)
46 CFR 154.1818(b)(3) |
| .05 Verify temperature limitations that impact inhibitor's effectiveness | IGC (2016) 17.8.3
GC Code 17.10(c)
46 CFR 154.1818(b)(4) |
| .06 Verify procedures if voyage exceeds effective lifetime of inhibitor | IGC (2016) 17.8.4
GC Code 17.10 (d)
46 CFR 154.1818(b)(5) |

Logs and Manuals Examination (LM)**FGCE-LM01 - Examine Cargo Record Book (CRB)**

- | | |
|---------------------|---|
| .01 Verify presence | MARPOL II/15.5 |
| .02 Verify format | MARPOL II/15.1
MARPOL II/Appendix II |

- | | | |
|-----|---------------------------|----------------|
| .03 | Verify entries are signed | MARPOL II/15.4 |
| .04 | Verify pages are signed | MARPOL II/15.4 |

Logs and Manuals Examination (LM)

FGCE-LM02 - Examine Procedures & Arrangement (P&A) Manual

- | | | |
|-----|-----------------|---|
| .01 | Verify approved | MARPOL II/14.1 |
| .02 | Verify format | MARPOL II/14.1
MARPOL II/Appendix IV |

Logs and Manuals Examination (LM)

FGCE-LM03 - Examine Shipboard Marine Pollution Emergency Plan (SMPEP) for Noxious Liquid Substances (NLS)

- | | | |
|-----|--|------------------|
| .01 | Verify approved | MARPOL II/17.1 |
| .02 | Verify emergency contacts are identified | MARPOL II/17.2.2 |

Logs and Manuals Examination (LM)

FGCE-LM04 - Examine Cargo Information

- | | | |
|-----|--|--|
| .01 | Verify cargo physical and chemical properties | IGC (2016) 18.3.1.1
GC Code 18.1(a)
46 CFR 154.1810(a)(5) |
| .02 | Verify information regarding cargo reactivity IAW the Certificate of Fitness | IGC (2016) 18.3.1.2 |
| .03 | Verify procedures for spills or leaks are fully described | IGC (2016) 18.3.1.3
GC Code 18.1(b)
46 CFR 154.1810(a)(3) |
| .04 | Verify counter measure procedures for personnel who come in contact with cargo(es) | IGC (2016) 18.3.1.4
GC Code 18.1(c)
46 CFR 154.1810(a)(1) |
| .05 | Verify fire fighting procedures and extinguishing media | IGC (2016) 18.1.4
GC Code 18.1(d)
46 CFR 154.1810(a)(4) |
| .06 | Verify procedures and special equipment needed for safe handling cargo(es) | IGC (2016) 18.3.1.6
GC Code 18.1(f)
46 CFR 154.1810(a)(16) |
| .07 | Verify emergency procedures | IGC (2016) 18.3.1.7
GC Code 18.1(h)
46 CFR 154.1810(a)(15) |

Logs and Manuals Examination (LM)

FGCE-LM05 - Examine Cargo Operations Manuals

- | | | |
|-----|---|---|
| .01 | Verify presence | IGC (2016) 18.2.1
IGC (2016) 18.2.2 |
| .02 | Verify cargo operations manual includes content required in IGC Code 18.2.2 | IGC (2016) 18.2.2
GC Code 18.1
46 CFR 154.1810(a) |

Logs and Manuals Examination (LM)

FGCE-LM06 - Examine loading and stability information booklet

- | | | |
|-----|---|--|
| .01 | Verify service conditions including loading, unloading and ballasting | IGC(2016) 2.2.5
GC Code 2.2.3
46 CFR 154.1809(b)(1) |
| .02 | Verify survival capabilities | IGC (2016) 2.2.5
GC Code 2.2.3
46 CFR 154.1809(b)(2) |

.03 Verify vessel fitted with stability instrument IGC(2016) 2.2.6

General Health & Safety Examination (GH)

FGCE-GH01 - Examine decontamination showers

- .01 Verify locations and marked IGC (2016) 14.4.3
- .02 Verify operation IGC (2016) 14.4.3

General Health & Safety Examination (GH)

FGCE-GH02 - Examine eye wash stations

- .01 Verify locations and marked IGC (2016) 14.4.3
- .02 Verify operation IGC (2016) 14.4.3

General Health & Safety Examination (GH)

FGCE-GH03 - Examine respiratory and eye protection

- .01 Verify presence IGC (2016) 14.4.2
- .02 Verify filter type respiratory protection are not being used IGC (2016) 14.4.2.1
- .03 Verify SCBAs service duration IGC (2016) 14.4.2.2
- .04 Verify equipment markings IGC (2016) 14.1.2
IGC (2016) 14.4.2.3

General Health & Safety Examination (GH)

FGCE-GH04 - Examine personnel safety equipment

- .01 Verify presence IGC (2016) 14.3.1
GC Code 14.3
- .02 Verify each set contains required equipment IGC (2016) 14.3.2
GC Code 14.4
- .03 Verify adequate supply of compressed air IGC (2016) 14.3.3
GC Code 14.5(a)(i) & (a)(ii)
GC Code 14.5(b)
- .04 Verify compressed air is inspected monthly IGC (2016) 14.1.3
GC Code 14.7
46 CFR 154.1846(a)
- .05 Verify compressed air inspected is inspected and tested annually IGC (2016) 14.1.3
GC Code 14.7

General Health & Safety Examination (GH)

FGCE-GH05 - Examine first aid equipment

- .01 Verify stretcher(s) IGC (2016) 14.2.1
GC Code 14.8
- .02 Verify presence of equipment IGC (2016) 14.2.2 & GC Code 14.9
Medical Guide
MFAG
- .03 Verify presence of oxygen resuscitation equipment IGC (2016) 14.2.2 & GC Code 14.9
Medical Guide
MFAG
- .04 Verify presence of antidotes (when applicable) GC Code 14.9
MFAG

General Health & Safety Examination (GH)

FGCE-GH06 - Examine air locks

- .01 Verify presence of air lock between hazardous area on the open weather deck and non-hazardous spaces IGC (2016) 3.6.1
- .02 Verify doors are self closing IGC (2016) 3.6.1
GC Code 3.6.2
- .03 Verify operation of audible alarm system IGC (2016) 3.6.3
GC Code 3.6.3
- .04 Verify operation of visual alarm IGC (2016) 3.6.3
GC Code 3.6.3
- .05 Verify no hold back arrangements for doors IGC (2016) 3.6.1
GC Code 3.6.2

Lifesaving Equipment Examination (LS)

FGCE-LS01 - Examine lifeboats

- .01 Verify condition of self contained air support system SOLAS 14 III/31.1.6
LSA Code 4.8
- .02 Verify condition of air supply system pressure visual indicators SOLAS 14 III/31.1.6
LSA Code 4.8
- .03 Verify presence and/or operation of fire-protection SOLAS 14 III/31.1.7
LSA Code 4.9

Firefighting Systems Examination (FF)

FGCE-FF01 - Examine fire water main equipment

- .01 Verify operation of fire main system IGC (2016) 11.2.1
GC Code 11.2.1
- .02 Verify fire hydrants locations IGC (2016) 11.2.2
GC Code 11.2.2
- .03 Verify variable nozzles IGC (2016) 11.2.4
GC Code 11.2.4
- .04 Verify condition of piping, valve nozzles IGC (2016) 11.2.5
GC Code 11.2.4
- .05 Verify remote operation of fire pump GC Code 11.2.5

Firefighting Systems Examination (FF)

FGCE-FF02 - Examine deck water spray system

- .01 Verify areas protected IGC (2016) 11.3.1
GC Code 11.3.1
- .02 Witness operational test IGC (2016) 11.3.2.1 & 3.2.2
IGC (2016) 11.3.3
GC Code 11.3.2
- .03 Verify local operation during carriage of Propylene Oxide and Ethylene Oxide IGC (2016) 17.18.30
GC Code 17.12.8(r)
- .04 Verify remote operation of pumps IGC (2016) 11.3.7
- .05 Verify capacity of fire pump if used to supply the system IGC (2016) 11.3.3
GC Code 11.3.3

Firefighting Systems Examination (FF)

FGCE-FF03 - Examine dry chemical powder fire-extinguishing system

- .01 Verify periodic system servicing is completed SOLAS 14 II-2/14.2.2
IMO MSC.1/Circ.1432
- .02 Verify condition of independent self- IGC (2016) 11.4.3

contained dry chemical powder units	CG Code 11.4.3
.03 Verify condition of inert gas storage pressure vessels	IGC (2016) 9.4.2 IGC (2016) 11.4.1 GC Code 11.4.2
.04 Verify condition of deck hoses and nozzles	IGC (2016) 11.4.4 GC Code 11.4.5
.05 Verify arrangement of deck monitors	IGC (2016) 11.4.3 GC Code 11.4.2
.06 Verify additional dry chemical powder units	IGC (2016) 11.4.3 GC Code 11.4.7

Firefighting Systems Examination (FF)

FGCE-FF04 - Examine cargo machinery room fixed fire-extinguishing system

.01 Verify periodic system servicing is completed	SOLAS 14 II-2/14.2.2 IMO MSC.1/Circ.1318
.02 Verify condition of agent storage bottles	SOLAS 14 II-2/14.2.1
.03 Verify all openings into space are capable of being secured	IGC (2016) 11.5.1 GC Code 11.5.1 SOLAS 14 II-2/5.2
.04 Verify system is properly marked	IGC (2016) 11.5.1 GC Code 11.5.1

Firefighting Systems Examination (FF)

FGCE-FF05 - Examine cargo machinery motor room fixed fire-extinguishing system

.01 Verify periodic servicing is completed	SOLAS 14 II-2/14.2.2 IMO MSC.1/Circ.1318
.02 Verify condition of agent storage bottles	SOLAS 14 II-2/14.2.1.2
.03 Verify openings into space are capable of being secured	IGC (2016) 11.5.1 SOLAS 14 II-2/5.2
.04 Verify system is marked	IGC (2016) 11.5.1

Firefighting Systems Examination (FF)

FGCE-FF06 - Examine firemen's outfits

.01 Verify presence	IGC (2016) 11.6.1 GC Code 11.6.1
.02 Verify condition of equipment	SOLAS 14 II-2/10.10.1 FSS Code 3.2
.03 Verify condition of outfits	SOLAS 14 II-2/14.2.2.1 SOLAS 14 II-2/14.2.2.3.11 SOLAS 14 II-2/10.3
.04 Verify stowage	

Electrical Systems Examination (ES)

FGCE-ES01 - Examine electrical installations

.01 Verify condition of electrical installations	GC Code 10.1.2 IGC (2016) 10.2.1 IEC 60029-502
.02 Verify electrical installations conform with recognized standards (IEC)	GC Code 10.2.2 IGC (2016) 10.2.2 IEC 60029-502
.03 Verify electrical equipment and wiring not installed in hazardous areas unless essential for operational purposes/safety enhancement	GC Code 10.1.2 IGC (2016) 10.2.3 IEC 60029-502
.04 Verify electrical equipment installed in hazardous areas are certified for installed location.	IGC (2016) 10.2.4

- .05 Verify electrical generation, distribution and associated control systems are designed that single fault will not result in loss of ability to maintain cargo tank pressures or hull structure temperatures within normal operating limits IGC (2016) 10.2.6
- .06 Verify lighting systems in hazardous areas are divided into at least two branch circuits. Verify all switches and protective devices interrupt all poles or phases and are located in non-hazardous areas. IGC (2016) 10.2.7
- .07 Verify submerged cargo pump motors automatically shut down in the event of low-liquid in the cargo tank IGC (2016) 10.2.9
- .08 Verify equipment not certified safe is de-energized upon loss of overpressure in space protected by an air lock. IGC (2016) 3.6.4

Instrumentation Examination (IE)

FGCE-IE01 - Examine fixed gas detection system

- .01 Verify calibration IGC (2016) 13.6.18
GC Code 13.6.10
Gas Detection Operator's Manual
- .02 Verify sampling points IGC (2016) 13.6.2
GC Code 13.6.7
Cargo Operations Manual
- .03 Verify location of sampling points IGC (2016) 13.6.12
GC Code 13.6.2
- .04 Verify integrity of sampling piping IGC (2016) 13.6.18
GC Code 13.6.8

Instrumentation Examination (IE)

FGCE-IE02 - Examine portable gas detection equipment

- .01 Witness calibration IGC (2016) 13.6.9
GC Code 13.6.13
Gas Detection Operator's Manual
- .02 Verify presence of two sets IGC (2016) 13.6.19
GC Code 13.6.13
- .03 Verify suitable for cargo(es) being carried IGC (2016) 13.6.19
GC Code 13.6.13
- .04 Verify presence & operation of instrument used for measuring oxygen levels in inert atmospheres IGC (2016) 13.6.20

Instrumentation Examination (IE)

FGCE-IE03 - Examine temperature indicating devices

- .01 Verify presence IGC (2016) 13.5.1
GC Code 13.5.1 & 13.5.4
- .02 Verify lowest temperature for cargo tank has been approved by Administration IGC (2016) 13.5.1
GC Code 13.5.1 & 13.5.4
- .03 Verify devices are within insulation or on a secondary barrier if cargo is carried at less than -55C IGC (2016) 13.7.2.2
GC Code 13.5.2 & 13.5.4

Instrumentation Examination (IE)

FGCE-IE04 - Examine pressure monitoring devices

- | | | |
|-----|---|-------------------------------------|
| .01 | Verify cargo tank vapor space pressure gauge and indicator in control location | IGC (2016) 13.4.1
GC Code 13.4.1 |
| .02 | Verify maximum/minimum allowable pressures are clearly indicated | IGC (2016) 13.4.1
GC Code 13.4.1 |
| .03 | Verify operation of cargo tank vapor space high pressure alarm(s) | IGC (2016) 13.4.2
GC Code 13.4.1 |
| .04 | Verify operation of cargo tank vapor space low pressure alarm(s) | IGC (2016) 13.4.2
GC Code 13.4.1 |
| .05 | Verify each manifold cargo line is fitted with pressure gauge | IGC (2016) 13.4.5
GC Code 13.4.2 |
| .06 | Verify hold/interbarrier spaces without open communication to atmosphere have pressure gauges | IGC (2016) 13.4.6
GC Code 13.4.4 |

Instrumentation Examination (IE)

FGCE-IE05 - Examine overflow control system

- | | | |
|-----|---|-------------------------------------|
| .01 | Verify high level alarm audible warning | IGC (2016) 13.3.1
GC Code 13.3.1 |
| .02 | Verify high level alarm visual warning | IGC (2016) 13.3.1
GC Code 13.3.1 |
| .03 | Verify automatic shutoff valve installation | IGC (2016) 13.3.2
GC Code 13.3.1 |

Topside Equipment Examination (TE)

FGCE-TE01 - Examine access to bow and emergency towing arrangements

- | | | |
|-----|--------------------------------------|---|
| .01 | Verify safe access | SOLAS 14 II-1/3-3.2
ICLL 25(4) & 26(2)
IMO Res MSC.62(67) |
| .02 | Verify emergency towing arrangements | SOLAS 14 II-1/3-4.1
IMO Res MSC.35(63) |

Cargo Systems Examination (CS)

FGCE-CS01 - Examine Emergency Shutdown (ESD) system

- | | | |
|-----|---|--|
| .01 | Verify ESD locations | IGC (2016) 18.10.3.1
GC Code 5.3.4(a) |
| .02 | Verify location of fusible elements | IGC (2016) 18.10.3.2
GC Code 5.3.4(a) |
| .03 | Verify ESD valves fully close within 30 seconds | IGC (2016) 18.10.2.1.3
GC Code 5.3.4(b) |
| .04 | Verify cargo pumps and compressors shutdown | IGC (2016) 18.10.3.3
GC Code 5.3.1(c) |

Cargo Systems Examination (CS)

FGCE-CS02 - Examine cargo tank pressure relief valves

- | | | |
|-----|---|--|
| .01 | Verify cargo tanks, including deck tanks, fitted with at least two pressure relief valves | IGC (2016) 8.2.1
GC Code 8.2.1 |
| .02 | Verify valves are sealed and approved by administration | IGC (2016) 8.2.6
GC Code 8.2.5 |
| .03 | Verify valve setting changes are documented | IGC (2016) 8.2.8
GC Code 8.2.7
46 CFR 154.1846(c)(2) |
| .04 | Verify screens are fitted on vent | IGC (2016) 8.2.15 |

Cargo Systems Examination (CS)**FGCE-CS03 - Examine cargo piping**

- | | | |
|-----|---|---|
| .01 | Verify low temperature piping is thermally isolated from hull | IGC (2016) 5.7.2
GC Code 5.2.2 |
| .02 | Verify hull is protected from low temperature liquid cargoes | IGC (2016) 5.7.2
GC Code 5.2.2 |
| .03 | Verify water curtain fitted under shore connections | IGC (2016) 5.7.3 |
| .04 | Verify all gasketed pipe joints are electrically bonded | IGC (2016) 5.7.4
GC Code 5.2.3 |
| .05 | Verify relief valves | IGC (2016) 5.5.6
GC Code 5.2.5(a) |
| .06 | Verify condition of piping | IGC (2016) 1.4.3 & 5.2.1
GC Code 5.2.6(d)(i) & 1.6.2 |

Cargo Systems Examination (CS)**FGCE-CS04 - Examine cargo system valves**

- | | | |
|-----|--|---|
| .01 | Verify MARVS not exceeding 0.7 bar gauge have manual shutoff valves on vapor/liquid lines | IGC (2016) 5.5.2.1
GC Code 5.3.1 (a) |
| .02 | Verify MARVS exceeding 0.7 bar gauge have manual shutoff valves on vapor/liquid lines | IGC (2016) 5.5.2.1
GC Code 5.3.1 (b) |
| .03 | Verify MARVS exceeding 0.7 bar gauge have remotely controlled emergency shutdown valve on vapor/liquid lines | IGC (2016) 5.5.2.2
GC Code 5.3.1 (b) |

Cargo Systems Examination (CS)**FGCE-CS05 - Examine cargo machinery room equipment**

- | | | |
|-----|--|--|
| .01 | Verify condition of cargo compressors | IGC (2016) 1.4.3
GC Code 3.3 & 1.6.2
MSM II/D.1.G.1.c(2) |
| .02 | Verify condition of cargo vaporizers | IGC (2016) 1.4.3
GC Code 3.3 & 1.6.2
MSM II/D.1.G.1.c(2) |
| .03 | Verify condition of gas tight seals on compressor shafts | IGC (2016) 3.3.4 & 1.4.3
GC Code 3.3.2 & 1.6.2
MSM II/D.1.G.1.c(2) |
| .04 | Verify condition of reliquefaction system | IGC (2016) 1.4.3
GC Code 7.2 & 1.6.2
MSM II/D.1.G.1.c(2) |

Cargo Environmental Control Examination (CE)**FGCE-CE01 - Examine Inert Gas System (IGS)**

- | | | |
|-----|---|-----------------------------------|
| .01 | Verify operational oxygen content meter | IGC (2016) 9.5.1
GC Code 9.5.1 |
| .02 | Verify operation of oxygen content alarm | IGC (2016) 9.5.1
GC Code 9.5.1 |
| .03 | Verify means to prevent the backflow of cargo gas | IGC (2016) 9.4.4
GC Code 9.5.2 |

Cargo Environmental Control Examination (CE)

FGCE-CE02 - Examine the Nitrogen Gas Generating System

- .01 Verify operational oxygen content meter IGC (2016) 9.5.1
GC Code 9.5.1
- .02 Verify operation of oxygen content alarm IGC (2016) 9.5.1
GC Code 9.5.1
- .03 Verify means to prevent the backflow of cargo gas IGC (2016) 9.4.4
GC Code 9.5.2

Cargo Environmental Control Examination (CE)

FGCE-CE03 - Examine Inert Gas/Nitrogen storage tanks

- .01 Verify sufficient storage IGC (2016) 9.2.1
GC Code 9.2.1 & 9.2.2(a)
- .02 Verify inert gas used for firefighting is carried in separate containers and not used for cargo services IGC (2016) 9.4.2
GC Code 9.4.2

Cargo Area Ventilation System Examination (CV)

FGCE-CV01 - Examine cargo machinery motor room ventilation system

- .01 Verify system can be controlled from outside of space IGC (2016) 12.1.1
GC Code 12.1.1
- .02 Verify motor room has a positive ventilation IGC (2016) 12.1.2
GC Code 12.1.4
- .03 Verify adjacent air locks have mechanical ventilation and are overpressured IGC(2016) 12.1.4
GC Code 3.6.5
- .04 Verify ventilation duct openings have protection screens IGC (2016) 12.1.9
GC Code 12.1.11
- .05 Verify warning notice is posted outside of space IGC (2016) 12.1.1
GC Code 12.1.1

Cargo Area Ventilation System Examination (CV)

FGCE-CV02 - Examine cargo machinery room ventilation system

- .01 Verify system can be controlled from outside of space IGC (2016) 12.1.1
GC Code 12.1.1
- .02 Verify cargo machinery room has a negative ventilation system IGC (2016) 12.1.2
GC Code 12.1.5
- .03 Verify ventilation extraction points IGC (2016) 12.1.2
GC Code 12.1.3
- .04 Verify ventilation duct openings have protection screens IGC (2016) 12.1.9
GC Code 12.1.11
- .05 Verify warning notice is posted outside of space IGC (2016) 12.1.1
GC Code 12.1.1

Gas Fuel Supply System Examination (GF)

FGCE-GF01 - Examine master gas valve

- .01 Verify closing for loss of pressurization in double wall gas fuel piping IGC (2016) 16.4.3.1
GC Code 16.7
- .02 Verify closing for loss of ventilation for duct and casing (vent hood) IGC (2016) 16.4.3.2
GC Code 16.7
- .03 Verify closing for leakage of gas detected IGC (2016) 16.4.8
GC Code 16.7

Gas Fuel Supply System Examination (GF)

FGCE-GF02 - Examine ventilation within the ventilation hood or casing

- .01 Verify ventilation flow across Gas Utilization Unit(s) IGC (2016) 16.3.1
GC Code 16.5
- .02 Verify ventilating air is exhausted at top IGC (2016) 16.3.1
GC Code 16.5

Gas Fuel Supply System Examination (GF)

FGCE-GF03 - Examine gas detection system used for protection of cargo fuel system

- .01 Verify operation of alarm IGC (2016) 16.4.8
GC Code 16.10
- .02 Verify master gas valve closes IGC (2016) 16.4.8
GC Code 16.5 & 16.10

Gas Fuel Supply System Examination (GF)

FGCE-GF04 - Examine double block and bleed

- .01 Verify each has two valves in series IGC (2016) 16.4.5
GC Code 16.6
- .02 Verify each has one valve located between the two valves IGC (2016) 16.4.5
GC Code 16.6

Gas Fuel Supply System Examination (GF)

FGCE-GF05 - Examine gas fuel piping (double wall piping system)

- .01 Verify space between concentric pipes is pressurized IGC (2016) 16.4.3.1
GC Code 16.2(a)
- .02 Verify operation of alarms GC Code 16.2(a)

Gas Fuel Supply System Examination (GF)

FGCE-GF06 - Examine gas fuel piping (ventilated pipe or duct system)

- .01 Verify operation of mechanical exhaust ventilation IGC (2016) 16.4.3.2
GC Code 16.2(b)
- .02 Verify operation of gas detection IGC (2016) 13.6.2.5
GC Code 16.2(b)

Gas Fuel Supply System Examination (GF)

FGCE-GF07 - Examine the Gas Combustion Unit (GCU)

- .01 Verify operational condition IGC (2016) 7.4
- .02 Verify flame failure shutdown IGC (2016) 7.4.4.1
Operations Manual
- .03 Verify automatic purge of gas fuel piping to burners by means of inert gas IGC (2016) 7.4.4.3
- .04 Verify combustion chamber automatically purges prior to relighting after flame failure IGC (2016) 7.4.4.4
- .05 Verify combustion chamber can be manually purged IGC (2016) 7.4.4.5

Follow Up Actions (FU)

FGCE-FU01 - Complete MISLE Activity

- | | |
|---|------------------------|
| .01 Ensure COC status is changed from "In Process" to "Valid" | Work Instruction 5.e.1 |
| .02 Scan COC & SOE into MISLE documents for Initial and Renewal examinations | Work Instruction 8 |
| .03 Change SOE status from "In Process" to "Valid" on the MSC issued certificate | Work Instruction 5.e.1 |
| .04 Add Issue & Expiration dates to the scanned copy of the SOE | Work Instruction 5.e.1 |