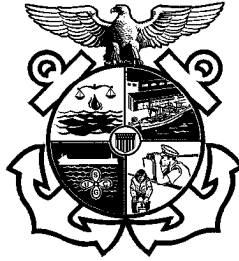


# United States Coast Guard



## FOREIGN GAS CARRIER Job Aid

<b>Name of Vessel:</b>	<b>Flag:</b> <input type="checkbox"/> No Change
<b>IMO Number:</b>	<b>Activity Number:</b>
<b>Date Completed:</b>	<b>Priority:</b>
<b>Location:</b>	
<b>Certificate of Compliance:</b> <input type="checkbox"/> Issued <input type="checkbox"/> Endorsed	
<b>Vessel Built in Compliance with SOLAS:</b> 60    74    74/78    NA	
<b>Port State Control Officer &amp; Examiners</b> 1. _____ 3. _____ 2. _____ 4. _____	

Job Aid FGCE  
Rev. Dec 2017

## Use of Foreign Gas Carrier Job Aid

This examination book is intended to be used as a job aid by Coast Guard Port State Control Officers (PSCOs) during Certificate of Compliance examinations of foreign-flagged liquefied or compressed gas tank vessels and cargo monitors. This book contains an extensive list of possible examination items. It is not, however, the Coast Guard's intention to "examine" all items listed. As a port state responsibility, PSCOs must verify that the vessels and their crews are in substantial compliance with international conventions and applicable U.S. laws. The depth and scope of the examination must be determined by the PSCOs based on the condition of the ship, operation of its systems and the competency of the ship's crew.

This Job 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.

This Job Aid does not establish or change Federal laws or regulations. References given are only general guides. Refer to IMO publications, CFR's, the Port State Control Job Aid or NVIC's for specific regulatory references.

**NOTE:** *Additional information for procedures applicable to conducting foreign tank vessel examinations may be found in MSM Volume II, Chapter D6: Procedures Applicable to Foreign Tank Vessels. In addition to the CG Confined Space Entry Policy COMDTINST 5100.47, change 11, Gas Dangerous Spaces as defined in 46 CFR 154.47 and applicable IGC Code, represent additional workplace hazards.*

### **Guide to Examinations:**

#### **Pre-inspection Items**

- Review MISLE records
- Obtain copies of forms to be issued

#### **Post-inspection Items**

- Issue letters/certificates to vessel
  - Form A
  - Form B
  - COC
- Complete MISLE entries within 48 hours

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## Section 1: Administrative Items

### IMO Applicability Dates:

Reference	Dates
<b>1974 SOLAS (2014 Consolidated)</b>	
Chapter (I)	All Ships
Chapter (II-1)	01 JAN 09
Chapter (II-2)	01 JUL 02
Chapter (III)	01 JUL 98
Chapters (IV-XII)	All Ships
<b>1974 SOLAS (2009 Consolidated)</b>	
Chapter (II-1)	01 JAN 09
Chapter (II-2)	01 JUL 02
Chapter (III)	01 JUL 98
<b>1974 SOLAS (2004 Consolidated)</b>	
Chapter (II-1)	01 JUL 86
Chapter (II-2)	01 JUL 02
Chapter (III)	01 JUL 98
<b>1974 SOLAS (2001 Consolidated)</b>	
Chapter (II-1)	01 JUL 86
Chapter (II-2, III)	01 JUL 98
<b>1974 SOLAS (1997 Consolidated)</b>	
Chapters (II-1, II-2 Part A,C,D, III)	01 JUL 86
Chapter (II-2 Part B)	01 OCT 94
<b>1974 SOLAS (1981 Amendments)</b>	
Chapters (II-1, II-2, III)	01 SEP 84
<b>1974 SOLAS (Unamended)</b>	25 MAY 80
<b>1960 SOLAS</b>	Prior to 25 MAY 80

<p><b>74 SOLAS 2014 Consolidated</b> contains all amendments entered into force up-to 01 Jul 14. The following Amendments (resolutions) have entered into force since it was published. <a href="http://www.imo.org">www.imo.org</a></p> <p>MSC 365(93)</p> <p>MSC 366(93)</p>	<p>01 JUL 15</p> <p>01 JUL 15</p>
<p><b>FSS CODE (2007 edition)</b> The following Amendments (resolutions) have entered into force since it was published. <a href="http://www.imo.org">www.imo.org</a></p> <p>MSC 206(81)</p> <p>MSC 217(82) Annex 1</p> <p>MSC 217(82) Annex 2</p> <p>MSC 292(87)</p> <p>MSC 311(88)</p> <p>MSC 327(90)</p> <p>MSC 339(91)</p> <p>MSC 367(93)</p>	<p>01 JUL 10</p> <p>01 JAN 08</p> <p>01 JAN 10</p> <p>01 JAN 12</p> <p>01 JUL 12</p> <p>01 JAN 14</p> <p>01 JUL 14</p> <p>01 JAN 16</p>
<p><b>LSA Code (2010 edition)</b> The following Amendments (resolutions) have entered into force since it was published. <a href="http://www.imo.org">www.imo.org</a></p> <p>MSC 293(87)</p> <p>MSC 320(89)</p> <p>MSC 368(93)</p>	<p>01 JAN 12</p> <p>01 JAN 13</p> <p>01 JAN 16</p>
<p><b>ITC 1969</b></p>	<p>18 JUL 82</p>
<p><b>Load Line 1966</b></p> <p><b>Load Line 88 Protocol</b></p>	<p>21 JUL 68</p> <p>03 FEB 00</p>

<p><b>Load Line (2005 edition)</b> contains all amendments entered into force up-to 2003 Amendments. The following Amendments (resolutions) have entered into force since it was published. <a href="http://www.imo.org">www.imo.org</a></p> <p>MSC 172(79)  MSC 223(82)  MSC 270(85)  MSC 329(90)  MSC 356(92)  MSC 375(93)</p>	<p>01 JUL 06  01 JUL 08  01 JUL 10  01 JAN 14  01 JAN 15  01 JAN 16</p>
<p><b>MARPOL 2011 Consolidated</b> contains all amendments entered into force up-to 2011 Amendments. The following Amendments (resolutions) have entered into force since it was published. <a href="http://www.imo.org">www.imo.org</a></p> <p>MEPC 190(60)  MEPC 193(61)  MEPC 194(61)  MEPC 200(62)  MEPC 201(62)  MEPC 202(62)  MEPC 203(62)  MEPC 216(63)  MEPC 217(63)  MEPC 235(65)  MEPC 246(66)  MEPC 247(66)  MEPC 248(66)  MEPC 251(66)</p>	<p>01 AUG 11  01 JAN 14  01 FEB 12  01 JAN 13  01 JAN 13  01 JAN 13  01 JAN 13  01 AUG 13  01 AUG 13  01 OCT 14  01 JUL 15  01 JUL 15  01 JUL 15  01 SEP 15</p>
<p><b>STCW (2011 edition)</b> contains all amendments entered into force up-to 2011 Amendments. The following Amendments (resolutions) have entered into force since it was published. <a href="http://www.imo.org">www.imo.org</a></p> <p>MSC 373(93)  MSC 374(93)</p>	<p>28 APR 84  01 JAN 16  01 JAN 16</p>

<b>STCW</b>	28 APR 84
<p><b>STCW (2001 edition)</b> contains all amendments entered into force up-to 2000 Amendments. The following Amendments (resolutions) have entered into force since it was published.</p> <p>www.imo.org</p> <p>MSC 78(70)</p> <p>MSC 156(78)</p> <p>MSC 180(79)</p> <p>MSC 203(81)</p> <p>MSC 209(81)</p> <p>2010 Manila Conference (new 2011 Consolidated edition)</p>	<p>01 JAN 03</p> <p>01 JUL 06</p> <p>01 JUL 06</p> <p>01 JAN 08</p> <p>01 JAN 08</p> <p>01 JAN 12</p>
<b>ITC 1969</b>	18 JUL 82

Dates	Applicable IMO Gas Code	Applicable IMO Resolution	Document Issued
*** <b>Keel laid date</b> of 01 Jul 16 and beyond	IGC Code Adopted 22 May 2014	MSC.370(93)	International Certificate of Fitness
<b>Keel laid date</b> <u>between</u> 01 Oct 94 and 30 Jun 16	IGC Code 93 Edition	MSC.30(61)	International Certificate of Fitness
<b>Keel laid date</b> <u>between</u> 01 Jul 86 and 30 Sep 94	IGC Code	MSC.5(48)	International Certificate of Fitness
<b>Building contract date</b> <u>after</u> 31 Oct 76 or <b>Keel laid</b> <u>after</u> 31 Dec 76 or <b>Delivery</b> <u>after</u> 30 Jun 80	GC Code	A.328(IX)	Certificate of Fitness
<b>Delivery</b> <u>before</u> 31 Oct 76 or <b>Delivery</b> <u>after</u> 31 Oct 76 <b>but prior to</b> GC Code applicability	**EGC Code	**A.329(IX)	Certificate of Fitness

\*\* Ships built *prior* to the application of the GC Code are required to comply to the extent that they can do so. Provisions of the GC Code that are unable to be complied with must be identified on the COF.

\*\*\*This publication does not incorporate differences between the IGC Code, and reference (m), Amendments to the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), MSC.370 (93), 22 May 2014.



**Involved Parties & General Information:**

Owner's Agent:
Individual:
Phone Number:

Charterer's Agent:
Individual:
Phone Number: <input type="checkbox"/> Same as Owner's Agent

Owner: Listed on DOC or COFR
<input type="checkbox"/> No Change

Operator:
<input type="checkbox"/> No Change

## Vessel Information:

Classification Society	
ISM Issuer: Same as above?	
<input type="checkbox"/> Yes <input type="checkbox"/> No If not the same, which Recognized Organization? _____	
<b>NOTE:</b> The period of validity for ISM documents should correspond to the following list. If they do NOT, ISM documents should be further investigated.	
<input type="checkbox"/> 5 years = Full term (SMS and DOC) <input type="checkbox"/> 12 months = Interim (DOC) <input type="checkbox"/> 6 months = Interim (SMC) <input type="checkbox"/> 5 months = Short term (SMC)	
Last Drydocking Date:	Next Drydocking Date:
Location of Last Drydocking:	
Date of Last Class Survey:	
<input type="checkbox"/> Outstanding conditions of class or non-conformities	
Last Port of Call:	Next Port of Call:
Cargo:	Current Operations:
Call Sign:	<input type="checkbox"/> No Change
Gross Tons:	<input type="checkbox"/> No Change
Built Date: (use delivery date)	<input type="checkbox"/> No Change
Overall Length: (in feet)	<input type="checkbox"/> No Change
Cargoes Carried:	Quantities: (m <sup>3</sup> )

## Section 2: Certificates and Documents

Name of Certificate	Issuing Agency	ID #	Port Issued/ Country	Issue Date	Exp. Date	Endors. Date
<b>Certificate of Registry</b> <input type="checkbox"/> No Change						
<b>Classification Document</b> <input type="checkbox"/> No Change						
<b>Certificate of Financial Responsibility (COFR)</b> <input type="checkbox"/> No Change	USCG					
<b>Certificate of Compliance</b> <input type="checkbox"/> No Change						
<b>Cargo Ship Safety Construction</b> <input type="checkbox"/> No Change						
<b>Cargo Ship Safety Equipment</b> <input type="checkbox"/> No Change						

Name of Certificate	Issuing Agency	ID #	Port Issued/ Country	Issue Date	Exp. Date	Endors. Date
<b>Cargo Ship Safety Radio</b> <input type="checkbox"/> No Change						
<b>International Load Line (ILLC)</b> <input type="checkbox"/> No Change						
<b>International Tonnage (ITC)</b> <input type="checkbox"/> No Change						
<b>ISM Document of Compliance (DOC)</b> <input type="checkbox"/> No Change						
<b>ISM Safety Management (SMC)</b> <input type="checkbox"/> No Change						
<b>International Ship Security (ISSC)</b> <input type="checkbox"/> No Change						
<b>Continuous Synopsis Record (CSR)</b> <input type="checkbox"/> No Change						

Name of Certificate	Issuing Agency	ID #	Port Issued/ Country	Issue Date	Exp. Date	Endors. Date
<b>Minimum Safe Manning (MSM)</b> <input type="checkbox"/> No Change						
<b>Subchapter "O" Endorsement</b> <input type="checkbox"/> No Change						
<b>Certificate of Fitness</b> <input type="checkbox"/> No Change						
<b>International Oil Pollution Prevention (IOPP)</b> <input type="checkbox"/> No Change						
<b>International Sewage Pollution Prevention (ISPP)</b> <input type="checkbox"/> No Change						
<b>International Air Pollution Prevention (IAPP)</b> <input type="checkbox"/> No Change						

### Section 3: Inspection Items

- |                          |  |   |
|--------------------------|--|---|
| <input type="checkbox"/> | 1. Schedule examination in Maritime Information for Safety and Law Enforcement (MISLE )                        | 33 CFR 2<br>33 CFR 6                          |
| <input type="checkbox"/> | 2. Prepare Certificate of Compliance (COC) for issuance  | MPS-PR-SEC-04                                 |
| <input type="checkbox"/> | 3. Coordinate examination with vessel's representative   | MPS-PR-SEC-02<br>MSM II/D.5.C.2               |
| <input type="checkbox"/> | 4. Mitigate potential hazards encountered during an exam   | NFPA 306                                      |
| <input type="checkbox"/> | 5. Conduct safety meeting  | MSM I/10.D.5.A<br>MSM I/ 8.A.3                |
| <input type="checkbox"/> | 6. Examine anchor(s) and chain   | MSM II/E.2.6.b<br>ILO-147 p48/3(g)            |
| <input type="checkbox"/> | 7. Examine hull for required markings  | ICLL 5-9                                      |
| <input type="checkbox"/> | 8. Examine material condition of hull  | 33 USC 1321<br>MARPOL I/15                    |
| <input type="checkbox"/> | 9. Examine access ladders and sideshell openings   | 29 CFR 1915.74(a)<br>SOLAS 14 II-1/3-9        |
| <input type="checkbox"/> | 10. Examine hull, anchors and anchor chain for compliance with the Non-Indigenous Aquatic Nuisance Species Act | 33 CFR 151.2050(e)(f)<br>MSM II/D.1.G.1.t     |
| <input type="checkbox"/> | 11. Examine mooring system/equipment   | MSM II/E.2.6.b                                |
| <input type="checkbox"/> | 12. Examine security procedures at vessel access point(s)  | 33 CFR 104.265(a)<br>ISPS A/7.2.2             |
| <input type="checkbox"/> | 13. Verify security training & records   | 33 CFR 104.215 & 104.220<br>SOLAS 14 XI-2/4.2 |
| <input type="checkbox"/> | 14. Examine Certificate of Registry  | 46 USC 3303<br>SOLAS 14 I/13                  |
| <input type="checkbox"/> | 15. Examine Classification Society Certificate   | SOLAS 14 I/6(a)                               |
| <input type="checkbox"/> | 16. Examine International Tonnage Certificate (ITC)  | ICTM 69 Article 7                             |
| <input type="checkbox"/> | 17. Examine International Load Line Certificate (ILLC)   | ICLL Article 16                               |
| <input type="checkbox"/> | 18. Examine Cargo Ship Safety Construction Certificate (CSSCC)   | SOLAS 14 I/12(a)(ii)<br>SOLAS 14 I/16         |
| <input type="checkbox"/> | 19. Examine Cargo Ship Safety Equipment Certificate (CSSEC) and Record of Equipment (Form-E)                   | SOLAS 14 I/12(a)(iii)<br>SOLAS 14 I/16        |
| <input type="checkbox"/> | 20. Examine Cargo Ship Safety Radio Certificate (CSSRC) and Record of Equipment (Form-R)                       | SOLAS 14 I/12(a)(iv)<br>SOLAS 14 I/16         |
| <input type="checkbox"/> | 21. Examine Cargo Ship Safety Certificate (CSSC) and Record of Equipment (Form-C)                              | SOLAS 14 I/12(a)(v)<br>SOLAS 14 I/16          |
| <input type="checkbox"/> | 22. Examine copy of Document of Compliance (ISM-DOC)   | 33 CFR 96.330<br>SOLAS 14 IX/4.2              |

<input type="checkbox"/>	23. Examine Safety Management Certificate (ISM-SMC)	SOLAS 14 IX/4.3 ISM Code 13.7
<input type="checkbox"/>	24. Examine Minimum Safe Manning Document	SOLAS 14 V/14.1
<input type="checkbox"/>	25. Examine Crew Certificates of Competency and Proficiency IAW Safe Manning Document	STCW I/2.11
<input type="checkbox"/>	26. Examine Medical Certificates	STCW I/9.3 COMDTINST 16711.12A
<input type="checkbox"/>	27. Examine Continuous Synopsis Record (CSR)	SOLAS 14 XI-1/5.1 SOLAS 14 XI-1/5.10
<input type="checkbox"/>	28. Examine International Ship Security Certificate (ISSC)	SOLAS 14 XI-2/4.2 ISPS Code A/19.2.1
<input type="checkbox"/>	29. Examine International Oil Pollution Prevention Certificate (IOPP) and Record of Construction and Equipment (Form-A)	33 CFR 151.19 MARPOL I/7 & 8
<input type="checkbox"/>	30. Examine International Sewage Pollution Prevention Certificate (ISPP)	MARPOL IV/5 NVIC 01-09 Encl. 3
<input type="checkbox"/>	31. Examine International Air Pollution Prevention Certificate (IAPP)	MARPOL VI/6 CG-543 Policy Ltr 09-01
<input type="checkbox"/>	32. Examine the Engine International Air Pollution Prevention (EIAPP) Certificate(s)	MARPOL VI/13.8 NOx Code 2.1.1
<input type="checkbox"/>	33. Verify compliance with the Vessel General Permit (VGP)	VGP 1.5.1.1 & 10 VGP Table 1
<input type="checkbox"/>	34. Examine muster lists and emergency instructions	SOLAS 14 III/8.2
<input type="checkbox"/>	35. Examine ballast water management documents	33 CFR 151.2025(a)(1)
<input type="checkbox"/>	36. Examine Long-Range Identification & Tracking (LRIT) conformance test report	IMO MSC.1/Circ. 1307
<input type="checkbox"/>	37. Examine Ship Energy Efficiency Management Plan (SEEMP)	MARPOL VI/22
<input type="checkbox"/>	38. Examine International Energy Efficiency Certificate (IEEC)	MARPOL VI/6 CG-CVC Policy Ltr 13-02
<input type="checkbox"/>	39. Examine Energy Efficiency Design Index (EEDI)	MARPOL VI/20
<input type="checkbox"/>	40. Examine International Anti-fouling System Certificate (IAFS)	AFS 2 MSM II/D.1.G.t
<input type="checkbox"/>	41. Examine International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk	MARPOL II/5.3.2 MARPOL II/10
<input type="checkbox"/>	42. Examine International Certificate of Fitness (COF) for the Carriage of Liquefied Gases in Bulk (IGC (2016) Code)	IGC (2016) 1.4.4 IGC (2016) 1.4.6
<input type="checkbox"/>	43. Examine the Certificate of Fitness (COF) for the Carriage of Liquefied Gases in Bulk (GC Code)	GC Appendix GC 1.6.3

- |                          |  |  |
|--------------------------|--|--|
| <input type="checkbox"/> | 44. Examine Certificate of Fitness (COF) for the Carriage of Liquefied Gases in Bulk (EGC Code)                                  | GC 1.6.3(a)<br>GC 1.6.5 & GC Appendix          |
| <input type="checkbox"/> | 45. Verify documentation of allowable loading limits and maximum loading reference temperatures for each product carried onboard | IGC (2016) 15.6.1<br>GC 15.2                   |
| <input type="checkbox"/> | 46. Examine documentation applicable to changing and setting of cargo tank pressure relief valves                                | IGC (2016) 8.2.6<br>GC 8.2.5                   |
| <input type="checkbox"/> | 47. Examine crew training documentation  | STCW V/1-2.1                                   |
| <input type="checkbox"/> | 48. Examine Subchapter "O" Endorsement (SOE)   | 46 CFR 154.1802(1)<br>MSC Guidelines C1-43     |
| <input type="checkbox"/> | 49. Examine Certificate of Inhibition  | IGC (2016) 17.8.1<br>GC 17.10 (a)              |
| <input type="checkbox"/> | 50. Examine Cargo Record Book (CRB)  | MARPOL II/15.5                                 |
| <input type="checkbox"/> | 51. Examine Procedures & Arrangement (P&A) Manual  | MARPOL II/14.1                                 |
| <input type="checkbox"/> | 52. Examine Oil Record Book Part I (ORB)   | 33 CFR 151.25<br>MARPOL I/17.1                 |
| <input type="checkbox"/> | 53. Examine Shipboard Marine Pollution Emergency Plan (SMPEP) for Noxious Liquid Substances (NLS)                                | MARPOL II/17.1                                 |
| <input type="checkbox"/> | 54. Examine Non-Tank Vessel Response Plan (NTVRP)  | 33 USC 1321(a)(26)<br>33 USC 1321(j)(5)(A)(ii) |
| <input type="checkbox"/> | 55. Examine Cargo Operations Manual  | IGC (2016) 18.2.1<br>GC 18.2.2                 |
| <input type="checkbox"/> | 56. Examine Cargo Information  | IGC (2016) 18.3.1.1<br>GC 18.1(a)              |
| <input type="checkbox"/> | 57. Examine loading and stability information booklet  | IGC (2016) 2.2.5<br>GC 2.2.3                   |
| <input type="checkbox"/> | 58. Verify transfer personnel, procedures, equipment and records   | 33 CFR 155.700<br>33 CFR 155.710(e)(4)         |
| <input type="checkbox"/> | 59. Examine Garbage Management Plan  | 33 CFR 151.57<br>MARPOL V/9.2                  |
| <input type="checkbox"/> | 60. Examine Garbage Record Book  | 33 CFR 151.55<br>MARPOL V/9.3                  |
| <input type="checkbox"/> | 61. Examine training manuals   | SOLAS 14 II-2/15.2.3.1                         |
| <input type="checkbox"/> | 62. Examine liferaft maintenance records and service logs/reports  | SOLAS 14 III/36.7<br>SOLAS 14 III/20.6         |
| <input type="checkbox"/> | 63. Examine fire detection system maintenance and service logs/reports   | SOLAS 14 II-2/14.2.2.1<br>IMO MSC.1/Circ. 1432 |
| <input type="checkbox"/> | 64. Examine Logbook entries  | 33 CFR 164.25<br>SOLAS 14 V/26                 |
| <input type="checkbox"/> | 65. Examine fire fighting equipment maintenance and service logs/reports   | SOLAS 14 II-2/14.2.2.1<br>IMO MSC.1/Circ. 1432 |
| <input type="checkbox"/> | 66. Examine lifeboat maintenance records and service logs/reports  | SOLAS 14 III/36.7                              |
| <input type="checkbox"/> | 67. Examine charts and publications (when applicable)  | 33 CFR 164.33<br>SOLAS 14 V/19.2.1.4           |



- 68. Examine echo-sounding device 33 CFR 164.35(h)  
SOLAS 14 V/19.2.3.1
- 69. Examine electronic position fixing device 33 CFR 164.41  
SOLAS 14 V/19.2.1.6
- 70. Examine bridge navigation/propulsion indicators 33 CFR 164.35(f)  
SOLAS 14 V/19.2.5.4
- 71. Examine records of emergency training and drills SOLAS 14 III/19.3.2  
SOLAS 14 III/19.5
- 72. Examine radar(s) and Automatic Radar Plotting Aid (ARPA) 33 CFR 164.35(a) & 37  
SOLAS 14 V/19.2.3.2
- 73. Examine compasses 33 CFR 164.35(b)  
SOLAS 14 V/19.2.1.1
- 74. Witness operational test of steering gear SOLAS 14 II-1/29.7  
SOLAS 14 II-1/29.8
- 75. Examine Voyage Data Recorder (VDR) SOLAS 14 V/20  
IMO Res A.861(20)
- 76. Examine Automatic Identification System (AIS) 33 CFR 164.46  
SOLAS 14 V/19.2.4
- 77. Examine radiotelephone (VHF) 33 CFR 26.03  
SOLAS 14 IV/7.1
- 78. Examine Global Maritime Distress and Safety System (GMDSS) equipment SOLAS 14 IV/8-11  
IMO Res A.694(17)
- 79. Examine Long-Range Identification & Tracking (LRIT) equipment SOLAS 14 V/19-1 .4.1  
CG-543 Guidance
- 80. Examine daylight signaling lamp SOLAS 14 V/19.2.2.2
- 81. Examine internal means of communication SOLAS 14 II-1/37
- 82. Examine accommodations ILO-147 p33/1-3 & 13  
ILO-147 p34/12
- 83. Examine hospital space ILO-147 p38/27  
COMDTINST 16711.12A 7(1)(e)
- 84. Examine galley ILO-147 p31/1(b)  
COMDTINST 16711.12A 7(1)(f)
- 85. Examine refrigerator and dry food stores ILO-147 p30/2  
COMDTINST 16711.12A 7(1)(f)
- 86. Examine sanitation areas ILO-147 p36/18-20  
COMDTINST 16711.12A 7(1)(d)
- 87. Examine vessel for general safety items ILO-147 p45/3(b)  
COMDTINST 16711.12A 7(1)©
- 88. Examine means of escape SOLAS 14 II-2/13.1  
SOLAS 14 II-2/13.3.3
- 89. Avoid inadvertent entry into a confined space 29 CFR 1915, Part B  
MSM I/10
- 90. Examine decontamination showers IGC (2016) 14.4.3
- 91. Examine eye wash stations IGC (2016) 14.4.3
- 92. Examine respiratory and eye protection IGC (2016) 14.4.2
- 93. Examine personnel safety equipment IGC (2016) 14.3.1  
GC 14.3
- 94. Examine first aid equipment IGC (2016) 14.2.1  
GC 14.8

- |                          |  |   |
|--------------------------|--|---|
| <input type="checkbox"/> | 95. Examine air locks  | IGC (2016) 3.6.1<br>GC 3.6.2  |
| <input type="checkbox"/> | 96. Examine life jackets   | SOLAS 14 III/7.2.1.1<br>SOLAS 14 III/7.2.1.2                                  |
| <input type="checkbox"/> | 97. Examine immersion suits and stowage (when applicable)                                | SOLAS 14 III/7.3<br>SOLAS 14 III/32.2 & .3                                    |
| <input type="checkbox"/> | 98. Examine line throwing appliance  | SOLAS 14 III/18<br>LSA Code 7.1.1.2   |
| <input type="checkbox"/> | 99. Examine pyrotechnics   | SOLAS 14 III/6.3  |
| <input type="checkbox"/> | 100. Examine quick-release life buoys  | SOLAS 14 III/7.1.3  |
| <input type="checkbox"/> | 101. Examine life buoys  | SOLAS 14 III/4<br>LSA Code 2.1.1  |
| <input type="checkbox"/> | 102. Examine lifeboat  | SOLAS 14 III/31.1<br>SOLAS 14 III/31.2<br>SOLAS 14 III/31.1.6<br>LSA Code 4.8 |
| <input type="checkbox"/> | 103. Examine muster and embarkation stations   | SOLAS 14 III/11.2 & .3<br>SOLAS 14 III/11.6                                   |
| <input type="checkbox"/> | 104. Examine inflatable liferafts and installations                                      | SOLAS 14 III/4  |
| <input type="checkbox"/> | 105. Examine rescue boat   | SOLAS 14 III/31.2<br>LSA Code 5.1.1.1   |
| <input type="checkbox"/> | 106. Examine boat davits (rescue & lifeboat)   | SOLAS 14 III/20.2 & .4<br>LSA Code Chapter 8                                  |
| <input type="checkbox"/> | 107. Examine general emergency systems   | SOLAS 14 III/6.4.2<br>LSA Code 7.2.1.1  |
| <input type="checkbox"/> | 108. Examine fire hose stations  | SOLAS 14 II-2/10.2.3.1.1<br>SOLAS 14 II-2/10.3.1.2                            |
| <input type="checkbox"/> | 109. Examine international shore connection  | SOLAS 14 II-2/15.2.4.1  |
| <input type="checkbox"/> | 110. Examine fire-fighter's outfits  | SOLAS 14 II-2/15.2.4.1<br>IGC (2016) 11.6.1<br>GC 11.6.1                      |
| <input type="checkbox"/> | 111. Examine portable fire extinguishers   | SOLAS 14 II-2/15.2.4.1<br>MSM II/D.1.G.1.o(6)(a)                              |
| <input type="checkbox"/> | 112. Examine Fire Control Plan   | SOLAS 14 II-2/15.2.4.1  |
| <input type="checkbox"/> | 113. Examine areas for compliance with Structural Fire Protection (SFP) requirements     | SOLAS 14 II-2/9.2.3<br>SOLAS 14 II-2/15.2.4.1                                 |
| <input type="checkbox"/> | 114. Examine fixed fire detection and alarm systems                                      | SOLAS 14 II-2/7.4 & .5<br>SOLAS 14 II-2/14.2.1.1.2                            |
| <input type="checkbox"/> | 115. Examine fire main system(s)   | SOLAS 14 II-2/10.2.2.2  |
| <input type="checkbox"/> | 116. Examine fire water main equipment   | IGC (2016) 11.2.1<br>GC 11.2.1  |
| <input type="checkbox"/> | 117. Examine the fixed pressure water-spraying and water mist fire extinguishing systems | SOLAS 14 II-2/10.4.1.1.3<br>SOLAS 14 II-2/10.4.4                              |
| <input type="checkbox"/> | 118. Examine deck water spray system   | IGC (2016) 11.3.1<br>GC 11.3.1  |

<input type="checkbox"/>	119. Examine fixed high pressure CO2 system	SOLAS 14 II-2/10.4.1.1.1 MSM II/D.1.G.1.o(6)(a)
<input type="checkbox"/>	120. Examine low pressure CO2 fixed fire fighting system	SOLAS 14 II-2/10.4.1.1.1 MSM II/D.1.G.1.o(6)(a)
<input type="checkbox"/>	121. Examine fixed high-expansion foam fire extinguishing system	SOLAS 14 II-2/10.4.1.1.2 MSM II/D.1.G.1.o(6)(a)
<input type="checkbox"/>	122. Examine dry chemical powder fire-extinguishing system	SOLAS 14 II-2/14.2.2 IMO MSC.1/Circ.1432
<input type="checkbox"/>	123. Examine cargo machinery room fixed fire-extinguishing system	SOLAS 14 II-2/14.2.2 IMO MSC.1/Circ.1318
<input type="checkbox"/>	124. Examine cargo machinery motor room fixed fire-extinguishing system	SOLAS 14 II-2/14.2.2 IMO MSC.1/Circ.1318
<input type="checkbox"/>	125. Examine steering gear assembly and operation	SOLAS 14 II-1/29.1-.3
<input type="checkbox"/>	126. Examine arrangements for propulsion engine(s)	SOLAS 14 II-1/26.1
<input type="checkbox"/>	127. Examine main service generators and prime mover(s)	SOLAS 14 II-1/26.1
<input type="checkbox"/>	128. Examine emergency generator(s) and prime mover(s)	SOLAS 14 II-1/26.1 SOLAS 14 II-1/44.3
<input type="checkbox"/>	129. Examine machinery spaces	MSM II/D.1.G.1.c(2) IMO Res A.1052(27) Appendix 6/3.2
<input type="checkbox"/>	130. Examine transfer procedures (when applicable)	33 CFR 155.100 33 CFR 155.720
<input type="checkbox"/>	131. Examine bilge pumps installation, piping, and valves	SOLAS 14 II-1/35-1.2
<input type="checkbox"/>	132. Examine switchboards	SOLAS 14 II-1/40.1.3 SOLAS 14 II-1/45.2
<input type="checkbox"/>	133. Examine motor controllers	SOLAS 14 II-1/40
<input type="checkbox"/>	134. Examine controls and alarms for unattended machinery spaces (when applicable)	SOLAS 14 II-1/46.3
<input type="checkbox"/>	135. Examine electrical installations	IGC (2016) 10.1.2 GC 10.2.1
<input type="checkbox"/>	136. Examine general condition hull and structural members	ICLL 66 I/12-25 MSM II/D.1.G.1.b(1)
<input type="checkbox"/>	137. Examine structural/watertight integrity of the deck/hull	SOLAS 14 II-1/13-1.1 ICLL 66 I/12
<input type="checkbox"/>	138. Examine watertight doors and weathertight openings	SOLAS 14 II-1/15-1 SOLAS 14 II-1/16-1
<input type="checkbox"/>	139. Examine Oily Water Separator (OWS) and bilge monitor/alarm (OCM)	MARPOL I/14 G-PCV Policy Ltr 06-01
<input type="checkbox"/>	140. Examine Marine Sanitation Device (MSD)	33 CFR 159.7 MARPOL IV/9
<input type="checkbox"/>	141. Examine incinerator	MARPOL Annex VI/16.6.1 IMO Res MEPC.76(40)
<input type="checkbox"/>	142. Examine standard discharge connection	33 CFR 155.430 MARPOL I/13
<input type="checkbox"/>	143. Examine paint lockers	46 CFR 147.45

- 144. Examine storage of oxygen and acetylene cylinders 46 CFR 147.60(b)(1)
- 145. Examine fixed gas detection system IGC (2016) 13.6.18  
GC 13.6.10
- 146. Examine portable gas detection equipment IGC (2016) 13.6.9  
GC 13.6.13
- 147. Examine temperature indicating devices IGC (2016) 13.5.1  
GC 13.5.1 & 13.5.4
- 148. Examine pressure monitoring devices IGC (2016) 13.4.1  
GC 13.4.1
- 149. Examine overflow control system IGC (2016) 13.3.1  
GC 13.3.1
- 150. Examine Emergency Shutdown (ESD) system IGC (2016) 18.10.3.1  
GC 5.3.4(a)
- 151. Examine cargo tank pressure relief valves IGC (2016) 8.2.1  
GC 8.2.1
- 152. Examine cargo piping IGC (2016) 5.7.2  
GC 5.2.2
- 153. Examine cargo system valves IGC (2016) 5.5.2.1  
GC 5.3.1 (a)
- 154. Examine cargo machinery room equipment IGC (2016) 1.4.3  
GC 3.3 & 1.6.2
- 155. Examine Inert Gas System (IGS) IGC (2016) 9.5.1  
GC 9.5.1
- 156. Examine the Nitrogen Gas Generating System IGC (2016) 9.5.1  
GC 9.5.1
- 157. Examine Inert Gas/Nitrogen storage tanks IGC (2016) 9.2.1  
GC 9.2.1 & 9.2.2(a)
- 158. Examine cargo machinery motor room ventilation system IGC (2016) 12.1.1  
GC 12.1.1
- 159. Examine cargo machinery room ventilation system IGC (2016) 12.1.1  
GC 12.1.1
- 160. Examine master gas valve IGC (2016) 16.4.3.1  
GC 16.7
- 161. Examine ventilation within the ventilation hood or casing IGC (2016) 16.3.1  
GC 16.5
- 162. Examine gas detection system used for protection of cargo fuel system IGC (2016) 16.4.8  
GC 16.10
- 163. Examine double block and bleed IGC (2016) 16.4.5  
GC 16.6
- 164. Examine gas utilization unit(s) IGC (2016) 16.3.6  
GC 16.6
- 165. Examine gas fuel piping (double wall piping system) IGC (2016) 16.4.3.1  
GC 16.2(a)
- 166. Examine gas fuel piping (ventilated pipe or duct system) IGC (2016) 16.4.3.2  
GC 16.2(b)
- 167. Examine the Gas Combustion Unit (GCU) IGC (2016) 7.4  
IGC (2016) 1.5.3
- 168. Evaluate fire drill SOLAS 14 III/19.3.2  
SOLAS 14 III/19.5
- 169. Evaluate abandon ship drill SOLAS 14 III/19.3.4.1  
MSM II/D.1.G.1.r(1)

- 170. Issue deficiency(s) MSM II/D.1.C.8
- 171. Issue control action(s) MSM II/D.2.C
- 172. Verify deficiency corrections MSM II/D.1.G.3.f  
CG-5437A/B
- 173. Complete Maritime Information for  
Safety and Law Enforcement (MISLE) MSM I/12.H  
MISLE Work Instruction 3.b  
Activity Work Instruction 5.e.1

## Section 4: Drills

### Fire Drill:

Initial notifications	Familiarity with duties	Space isolation
General alarms / signals	Familiarity with equipment	Smoke control
Crew response	Fire pumps started	Arrange care of passengers
Properly dressed / equipped	Two jets of water	Communications w/ bridge
Language understood by crew	Fire doors and dampers	

SOLAS 09 III/19.3; MSM Vol. II/D.1.G.1.r (2); NVIC 6-91

Location: \_\_\_\_\_ Time on Scene: \_\_\_\_\_

Notes: \_\_\_\_\_  
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## Section 5: Appendices

### **Recommended Port State Control Procedures:**

The following flowcharts contain information gleaned from the Marine Safety Manual Volume II, Section D, Chapter 1: General Aspects of Port State Control Examinations. The port state control officer should be familiar with this section as well as the information pertaining to Procedures Applicable to Foreign Tank Vessels in Section D, Chapter 6.

Considering the seriousness of the deficiencies, the OCMI or COTP must determine the appropriate control action to impose on these vessels to ensure the safety of the vessel, the port and the environment. The degree of control imposed, as well as the authority used to exercise control, must be consistent with the nature of the deficiencies.

The following definitions and terms of reference are used in the MSM to describe key elements of Port State Control enforcement:

**Clear Grounds:** Evidence that the vessel, its equipment, or crew do not correspond substantially to the requirements of the relevant conventions or that the master or crew members are not familiar with essential shipboard procedures relating to the safety of vessels or the prevention of pollution.

**Control:** Control is the process of imposing a port state's or flag state's authority over a vessel to ensure that its structure, equipment, operation and crew meet applicable standards. The process is affected by any verbal or written directives from the OCMI/COTPs or their representatives, which require action or compliance by the vessel.

**Detention:** Detention is a control action that restricts a vessel's right of free movement. The imposition of a restriction on the movement of a vessel constitutes a detention regardless of whether or not a delay from a vessel's normal or expected itinerary occurs. Detentions may be carried out under the authority of the applicable international convention, the Ports and Waterways Safety Act (PWSA) or a Customs hold.

**Intervention:** An intervention is a control action taken by a port state, which interposes the port state's authority over a foreign flag vessel in order to cause the vessel to be brought into compliance with an applicable international convention. Interventions are undertaken by a port state when a vessel's flag state has not, can not, or will not exercise its obligations under an international convention to which it is a party. This may include requesting appropriate information, requiring the immediate or future rectification of deficiencies, detaining the vessel, or allowing the vessel to proceed to another port for repairs.



**Nonconforming Vessel:** Any vessel failing to comply with one or more applicable requirements of U.S. law or international conventions is a nonconforming vessel. A nonconforming vessel is not necessarily a substandard vessel unless the discrepancies endanger the vessel, persons on board, or present an unreasonable risk to the marine environment.

**Substandard Vessel:** In general, a vessel is regarded as substandard if the hull, machinery or equipment, such as lifesaving, firefighting and pollution prevention, are substantially below the standards required by U.S. laws or international conventions, owing to:

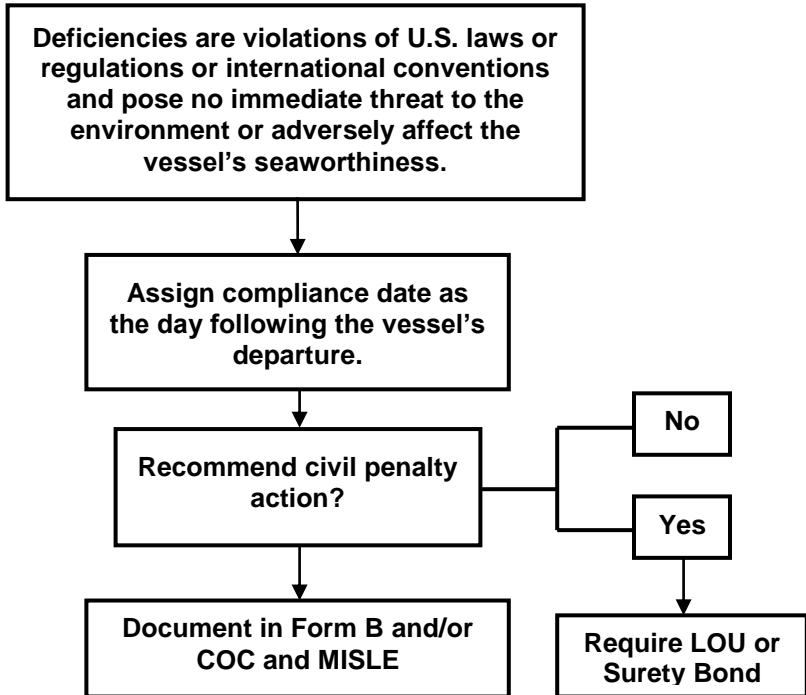
- The absence of required principal equipment or arrangement;
- Gross noncompliance of equipment or arrangement with required specifications;
- Substantial deterioration of the vessel structure or its essential equipment;
- Noncompliance with applicable operational and/or manning standards; or
- Clear lack of appropriate certification or demonstrated lack of competence on the part of the crew.

If these evident factors as a whole or individually endanger the vessel, persons on board, or present an unreasonable risk to the marine environment, the vessel should be regarded as a substandard vessel.

**Valid Certificates:** A certificate that has been issued directly by a contracting government or party to a convention, or on the behalf of the government or party by a recognized organization, and contains accurate and effective dates, meets the provisions of the relevant convention, and corresponds to the particulars of the vessel and its equipment.

## Requires Corrective Measures Prior to Return to U.S. Waters

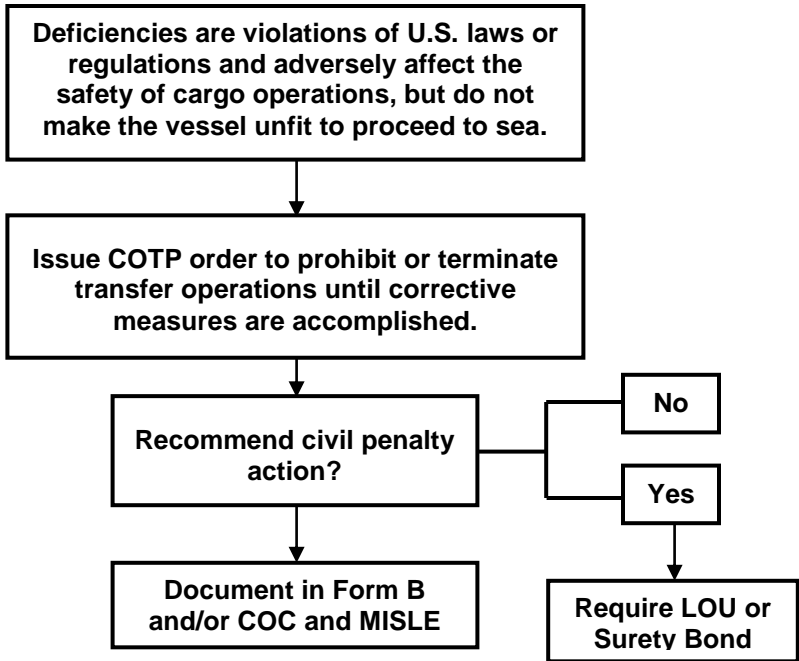
### (NO DETENTION)



Examples include the following:

- Charts or nautical publications not currently corrected.
- Portable hoses have not been tested but appear in good condition.
- Actual location of safety equipment deviates from the vessel safety plan.
- Electrical fixtures in paint locker not appropriately certified for safe usage in hazardous location. (Operational controls, such as disconnecting the electrical power source or removing flammables from the space, may satisfactorily remove risk to vessel.)

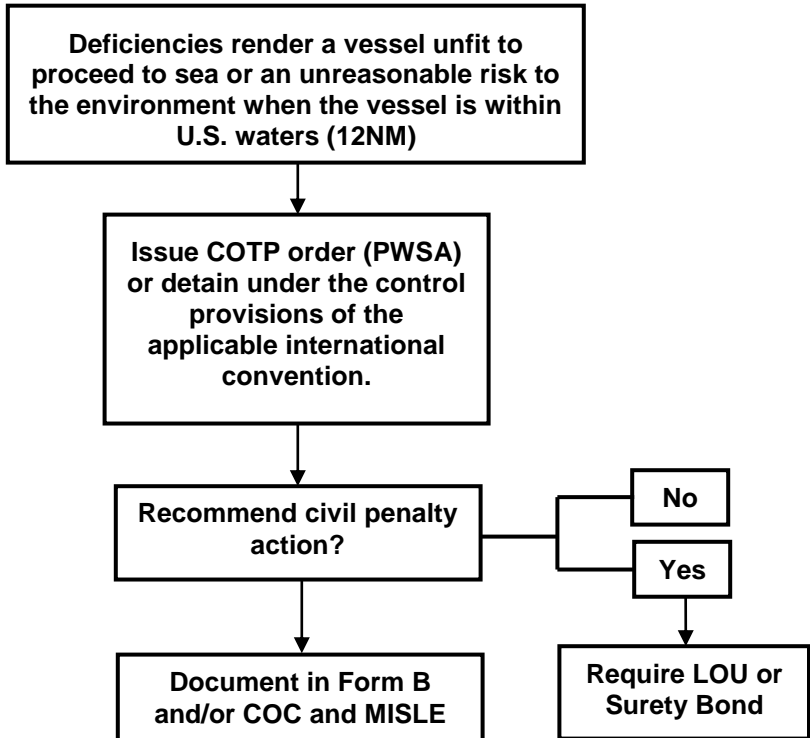
**Requires Corrective Measures Prior to Cargo, Bunkering  
or Lightering Operations**  
**(NO DETENTION)**



Examples include the following:

- Oil transfer procedures incomplete.
- Information on properties and hazards of cargoes not on board.
- High and low level alarms inoperative.

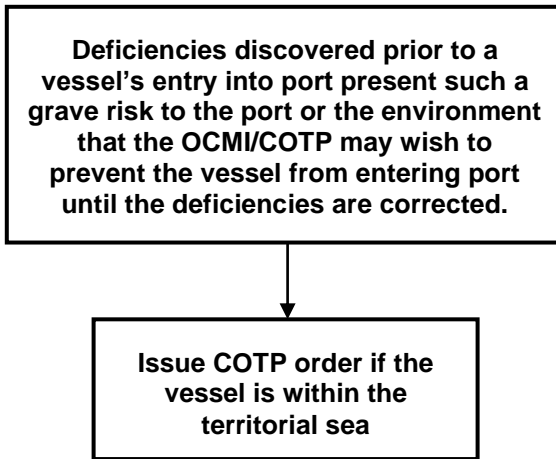
## Requires Corrective Measures Prior to Departure (DETENTION)



Examples include the following:

- Excessive wastage, corrosion, pitting, holes, or damage to the hull, cargo hatches, fire main, or other vital system.
- Inoperable emergency fire pump or emergency generator.
- Inability to lower lifeboats.
- Inoperable lifeboat motors (i.e., will not start).
- Crew incompetent to carry out duties (e.g., fire or boat drills, cargo transfer, stability calculations, etc.).
- Licenses invalid.
- Safe Manning Document not on board.

## Requires Corrective Measures Prior to Entry



Examples include the following:

- Leaking tanks.
- Carrying dangerous cargoes with expired documents.
- Carrying incompatible cargoes.
- Invalid ISM certificates.

**Detention Information:**

*NOTE: Complete prior to recommendation.*

- Verify owner (from DOC or COFR), operator and mailing address
- Verify owner's agent
- Verify last and future drydock dates and locations
- If dual classed, who will respond? \_\_\_\_\_
- Which agency issued the documents that have major problems?
  
- What is the date of the last survey conducted for those items that have problems?
  
- What are the vessel's plans to deal with the problems?
  
- What is the crew's attitude toward the problems?
  
- Is the detention ISM related? If so, include ISM certification information in the Detention Report to CG-CVC-2.

Notes: \_\_\_\_\_  
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# **Confined Space Entry Checklist**

## **Sources for Policy**

- COMDTINST M5100.47, Chapter 6, change 11
- MSM Vol. 1, Chapter 10 & Appendix A, C, G to chap. 10
- 29 CFR 1915, Part B

## **A Confined Space for the purpose of this checklist is:**

A space that possess all of the following three distinct characteristics –

1. Is large enough and so configured that an employee can bodily enter & perform assigned work;
2. Has limited or restricted means for entry or exit; and
3. Is not designed for continuous employee occupancy

## **Hazards associated with confined space entry**

- Oxygen deficient or enriched atmosphere
- Flammable atmosphere
- Toxic atmosphere
- Extreme temperature (hot or cold)
- Engulfment hazard (such as grain, coal, sand, gypsum or similar material)
- Extreme noise
- Slick / wet surfaces & tripping hazards
- Falling objects
- Potential for rapidly changing atmosphere

## **USCG Confined Space Entry Requirement**

A certified Marine Chemist **shall** conduct the initial inspection & certify all confined spaces on merchant vessels “Safe for Workers” before entry by USCG personnel.

In rare circumstances, if a Marine Chemist is not available, the OCMI may designate a USCG Competent Person to certify a confined space “Safe for Workers”

**Examples (not limited to) of confined spaces on gas carriers:**

<b><u>Confined Spaces</u></b>	<b><u>Hazard</u></b> <sup>2)</sup>
Voids/Cofferdams <sup>1)</sup>	P- O; S- F,T
Sealed Compartments <sup>1)</sup>	P- O; S- F,T
Double Bottoms/Sides/Duct Keels <sup>1)</sup>	P- O; S- F,T
Spaces Coated with a Preservative <sup>1)</sup>	P- O; S- F,T
Engine Crankcases/Scavenging Spaces <sup>1)</sup>	P- O; S- F,T
Large Heat Exchangers <sup>1)</sup>	P- O; S- F,T
Fuel/Lube Oil/Sludge Tanks <sup>1)</sup>	P- F,T; S- O
Water tanks <sup>1)</sup>	P- O; S- F,T
Cargo/Slop Tanks <sup>1)</sup>	P- O; S- F,T
Pump Rooms (if provided) <sup>3)</sup>	P- O; S- F,T

**1) Port State Control Officers should not attempt to enter any of the above spaces during a standard PSC examination, other than pump rooms. There may be reason to enter one or more of these spaces during the exam if there are clear grounds to do so, but only enter these spaces after ensuring they are safe for entry. Review the safe work practices contained in MSM Vol. 1, chapter 10, Appendix A for entry into confined spaces other than pump rooms.**

**2) Hazards – P (Primary);  
S (Secondary);  
O (Oxygen Deprivation);  
F (Flammability);  
T (Toxicity)**

**3) Follow steps on page 30 for entry into pump rooms**



**Examples (not limited to) of non-confined spaces that may pose a hazard on gas carriers:**

<b><u>Non-confined spaces that may pose a risk (All vessel types)</u></b>	<b><u>Possible Hazard(s)</u></b>	<b><u>Safe Work Practice</u></b>
CO <sub>2</sub> Storage Room	O <sub>2</sub> deprivation due to leaking CO <sub>2</sub>	Ensure proper ventilation, wear O <sub>2</sub> meter
Machinery Spaces	Noise, Flammability, Toxicity; MSDs – H <sub>2</sub> S	Hearing protection
Flammable Storage Lockers/Paint Rooms	Flammability, Toxicity	Ensure proper ventilation
Battery Room	Toxicity -	Ensure proper ventilation
Bosun Shop	O <sub>2</sub> deprivation	Ensure proper ventilation
Workshops	Toxicity from welding fumes, Flammability, Noise	Ensure proper ventilation
Provisions/Non-Flammable Storage	O <sub>2</sub> deprivation	Ensure proper ventilation
Compressor Rooms <sup>1)</sup>	O <sub>2</sub> deprivation, Flammability	See Note 1
Re-Liquefaction Plant Room <sup>1)</sup>	O <sub>2</sub> deprivation, Flammability	See Note 1
Re-Gasification Plant Room <sup>1)</sup>	O <sub>2</sub> deprivation, Flammability	See Note 1
Open Cargo Deck	Flammability	Ensure use of intrinsically safe radios, flashlight, phone, etc.

1) Space is monitored every thirty minutes by gas detection system. Enter these spaces after ensuring these are safe for entry and after ensuring the gas detection system is calibrated and functioning properly and gas levels detected are safe for entry. A marine chemist certificate is not required prior to entry.

## **. IMMEDIATELY LEAVE ANY CONFINED SPACE IF:**

- A personal monitor alarms;
- You feel dizzy or lightheaded;
- The forced air ventilation stops or is apparently ineffective; or
- If you sense any unexpected chemical through smell or dermal sensation that concerns you. This is a judgment call; however, you should depart any time there is a burning sensation in your lungs or you experience a shortness of breath. Any of these sensations may indicate a life threatening situation and you must react promptly to avoid injury.

Note: Climbing (other than on ladders) shall be limited to 5ft.

## **Steps to Take After Entry for All Confined Spaces**

- Immediately contact your chain of command if you left a confined space for any of the reasons noted above. Do not reenter any confined space until notification of appropriate senior personnel and direction from your supervisor is obtained.
- Report any inconsistencies in the marine chemist certificate or competent person log to your supervisor and follow-up with a letter to Commandant CG-1134 via your District (industrial hygienist).
- In the event of overexposure, personnel should be evacuated to appropriate medical facilities by the most expeditious means. Medical personnel should be provided with all known information on the suspected exposure, including concentration and duration of exposure. This should include the most probable route of exposure. Also provide the medical authority with the phone number to American Toxic Substance and Disease Registry (ATSDR).







## Conversions:

<b>Distance and Energy</b>				
Kilowatts (kW)	X	1.341	=	Horsepower (hp)
Feet (ft)	X	3.281	=	Meters (m)
Long Ton (LT)	X	.98421	=	Metric Ton (t)
<b>Liquid</b> (NOTE: Values are approximate.)				
Liquid	bb/LT	m <sup>3</sup> /t	bb/m <sup>3</sup>	bb/t
Freshwater	6.40	1.00	6.29	6.29
Saltwater	6.24	.975	6.13	5.98
Heavy Oil	6.77	1.06	6.66	7.06
DFM	6.60	1.19	7.48	8.91
Lube Oil	7.66	1.20	7.54	9.05
<b>Weight</b>				
1 Long Ton	=	2240 lbs	1 Metric Ton	= 2204 lbs
1 Short Ton	=	2000 lbs	1 Cubic Foot	= 7.48 gal
1 Barrel (oil)	=	5.61 ft = 42 gal = 6.29 m <sup>3</sup>	1 psi	= .06895 Bar = 2.3106 ft of water
<b>Temperature: Fahrenheit = Celsius</b> ( $^{\circ}\text{F} = 9/5\ ^{\circ}\text{C} + 32$ and $^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$ )				
0	=	-17.8	80	= 26.7
32	=	0	90	= 32.2
40	=	4.4	100	= 37.8
50	=	10.0	110	= 43.3
60	=	15.6	120	= 48.9
70	=	21.1	150	= 65.6
200	=	93.3	250	= 121.1
			300	= 148.9
			400	= 204.4
			500	= 260
			1000	= 537.8
<b>Pressure: Bars = Pounds per square inch</b>				
1 Bar	=	14.5 psi	5 Bars	= 72.5 psi
2 bars	=	29.0 psi	6 Bars	= 87.0 psi
3 Bars	=	43.5 psi	7 Bars	= 101.5 psi
4 Bars	=	58.0 psi	8 Bars	= 116.0 psi
			9 Bars	= 130.5 psi
			10 Bars	= 145.0 psi