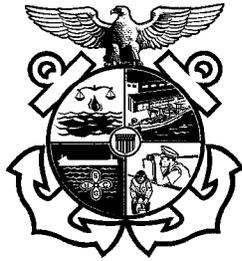


United States Coast Guard



**TANKSHIP
INSPECTION BOOK**

Name of Vessel		
Official Number	Class	
Date Completed	Location	
Vessel Built in Compliance with SOLAS: 60 74 74/78 N/A		
Route		
Oceans	Limited Coastwise	Lakes / Bays / Sounds
Coastwise	Great Lakes	Rivers
Inspection Type		
Inspection for Certification (COI)		Reinspection
Inspectors		
1. _____	3. _____	
2. _____	4. _____	

Total Time Spent Per Activity:

Regular Personnel (Active Duty)			
ACTIVITY TYPE	ACTIVITY	TRAINING	(PERS) MI

TOTAL ADMIN HOURS	TOTAL TRAVEL HOURS
-------------------	--------------------

Reserve Personnel			
ACTIVITY TYPE	ACTIVITY	TRAINING	(PERS) MI

TOTAL ADMIN HOURS	TOTAL TRAVEL HOURS
-------------------	--------------------

Auxiliary Resources	
TOTAL BOAT HOURS	TOTAL AIRCRAFT HOURS

Use of Tankship Inspection Book:

This inspection book is intended to be used as a job aid by Coast Guard marine inspectors during inspections of U.S. flagged tankships. The lists contained within this book are not intended to limit the inspection. Each marine inspector should determine the depth of inspection necessary. A checked box should be a running record of what has been inspected. It does not imply that the entire system has been inspected or that all or any items are in full compliance. This job aid does not constitute part of the official inspection record.

This document does not establish or change Federal laws or regulations. References given are only general guides. Refer to IMO publications, CFR's, NVIC's or any locally produced cite guides for specific regulatory references. Not all items in this book are applicable to all vessels.

NOTE: *Guidance on how to conduct inspections of U.S. flagged tankships can be found in the Marine Safety Manual (MSM) Volume II, Chapter B1: Inspection of Vessels for Certification. All MSM cites listed in this book refer to MSM Volume II unless otherwise indicated.*

Guide to Examinations:

- All vessels
- Vessels carrying dangerous cargoes in bulk

Pre-inspection Items:

- Review MSIS records.
 - MIPIP
 - MICOI
- Obtain copies of forms to be issued.

Post-inspection Items:

- Issue letters/certificates to vessel.
- Complete MSIS entries.
 - MIAR
 - MSDS
 - MIDR
 - VFLD
 - VFID
- Initiate Report of Violation (ROV) if necessary.

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Section 1: Administrative Items

IMO Applicability Dates:

Reference	Date
SOLAS 1960	26 MAY 65
SOLAS 1974	25 MAY 80
1978 Protocol to SOLAS 1974	01 MAY 81
1981 Amendments (II-1 & II-2)	01 SEP 84
1983 Amendments (III)	01 JUL 86
<i>Various additional amendments to SOLAS</i>	
MARPOL 73/78 Annex I	02 OCT 83
MARPOL 73/78 Annex II	06 APR 87
MARPOL 73/78 Annex III	01 JUL 92
MARPOL 73/78 Annex V	31 DEC 88
IBC Code	After 01 JUL 86
BCH Code	Prior to 01 JUL 86
IGC Code	After 01 JUL 86
IGC Code (for existing vessels)	Prior to 01 JUL 86
COLREGS 1972	15 JUL 77
<i>Various additional amendments to COLREGS</i>	
Load Line 1966	21 JUL 68
STCW 1978	28 APR 84
1991 Amendments	01 DEC 92
1994 Amendments	01 JAN 96
1995 Amendments	01 FEB 97

Involved Parties & General Information:

Vessel's Representatives _____ _____
Phone Numbers

Owner—Listed on DOC or COFR
No Change

Operator
No Change

Section 2: Certificates and Documents

Name of Certificate	Issuing Agency	ID #	Port Issued	Issue Date	Exp. Date	Endors. Date
Certificate of Documentation No Change	USCG					
Classification Document No Change						
Certificate of Financial Responsibility (COFR) No Change	USCG					
Safety Construction (SLC) No Change						
Safety Equipment (SLE) No Change	USCG					
Safety Radio (SLT) No Change						

Name of Certificates	Issuing Agency	ID #	Port Issued	Issue Date	Exp. Date	Endors. Date
International Load Line (ILL) No Change						
International Oil Pollution Prevention w/Form B (IOPP) No Change						
Certificate of Fitness (COF) No Change	USCG					
International Tonnage (ITC) No Change						
Safety Management (SMC) No Change						
Document of Compliance (DOC) No Change						

Certificates:

- COI posted 46 CFR 31.05-5
46 CFR 153.901
 - All pages visible
- ISM Code SOLAS 74/78 IX/3
 - Safety Management System
 - Shipboard Operations Plan
- Stability letter posted 46 CFR 35.08-1
- Waste management plan 33 CFR 151.57
(oceangoing vessels ≥ 40 feet)
- Annual drug and alcohol program audit 46 CFR Part 16
- Officers' licenses current 46 CFR 35.05-1
- GMDSS endorsement 47 CFR Part 80
 - FCC Station License
 - Safety Radio Certificate
- GMDSS maintenance personnel 47 CFR 80.1074
 - 1st Class Radiotelegraph Operator's Certificate
 - 2nd Class Radiotelegraph Operator's Certificate
 - 3rd Class Radiotelegraph Operator's Certificate
- Required international safety convention certificates posted and valid 46 CFR 31.40-35
- Liferaft servicing certificates 46 CFR 160.151-57(p)
SOLAS 74/78 III/19.8
 - Annual service
- Cargo Gear Certificate 46 CFR 31.37-75

Notes: _____

Logs and Manuals:

- Lifesaving equipment maintenance record 46 CFR 199.190(e)
SOLAS 74/78 III/19
 - Periodic checks as required
 - Visual inspection of survival craft / rescue boat and launching appliances
 - Operation of lifeboat / rescue boat engines
 - Lifesaving appliances, including lifeboat equipment examined

- Emergency training and drills SOLAS 74/78 III/18
 - Onboard training in use of lifesaving equipment (all crew members)
 - SOLAS training manual
 - Logbook records 46 CFR 199.180
 - Fire and lifeboat drills SOLAS 74/78 III/18.5
 - General alarm tested SOLAS 74/78 III/25

- Bridge log SOLAS 74/78 V/19
STCW 95 I/14
 - Pre-arrival tests conducted 33 CFR 164.25
 - Casualties (navigation equipment and steering gear failures reported) 33 CFR 164.53
 - Steering gear drills 46 CFR 35.07
 - Emergency steering drills

- Information available to master (as required) 46 CFR 42.15-1
 - Loading manual 46 CFR 31.10-32
 - Trim and stability book 46 CFR 45.105(a)

- Cargo and ballast system instruction manual 33 CFR 157.23
46 CFR 153.806

Pollution Prevention Records:

- Oil record book MARPOL Ax. I/20
33 CFR 151.25
 - Each operation signed by person-in-charge
 - Each complete page signed by master
 - Book maintained for 3 years

- Shipboard oil pollution emergency plan MARPOL Ax. I/26.1
33 CFR 151.26
 - Approved by Coast Guard / class society
 - Contact numbers correct
 - Immediate Actions List

Notes: _____

- Vessel response plan
 - Approved by Coast Guard
 - Annual review by owner / operator
- Verify vessel has access to shore-based computerized damage stability programs
- Oil transfer procedures

33 CFR 155.1030
 33 CFR 155.1035
 33 CFR 155.1065
 33 CFR 155.1070
 33 CFR 155.240
 33 CFR 155.720
 MARPOL 73/78 I/20

Chemical Cargo Records:

- Approved Procedures & Arrangement Manual
- Cargo record book
- Cargo information cards
- Cargo location plan
 - Cargo compatibility
- Cargo piping plan
- Shipping document
- Waiver letters carried
- Certificate of inhibition or stabilization
 - Date added to cargo
 - Length of time effective
 - Temperature limitations
- Current copy of 46 CFR Parts 35, 150, and 153 aboard

46 CFR 153.490(a)
 46 CFR 153.490(b)
 46 CFR 153.490
 46 CFR 153.907
 46 CFR 153.907
 46 CFR Part 150
 46 CFR 153.910
 46 CFR 153.907
 46 CFR 153.10
 46 CFR 153.912
 46 CFR 153.905

Notes: _____

Section 3: Inspection Items for All Vessels

Navigation Equipment:

- | | | |
|--------------------------|--|--|
| <input type="checkbox"/> | Navigation publications (as applicable) | 46 CFR 35.20-1
33 CFR 164.33
SOLAS 74/78 V/20 |
| | <ul style="list-style-type: none">• Current and corrected charts• U.S. Coast Pilot• Great Lakes Pilot• Sailing directions• Coast Guard Light List• Notice to mariners• Tide tables• Tidal current tables• International Rules of the Road• Inland Rules of the Road | |
| <input type="checkbox"/> | Operationally test radar(s) and ARPA | 46 CFR 32.15-30
33 CFR 164.35
33 CFR 164.37
33 CFR 164.38
SOLAS 74/78 V/12 |
| | <ul style="list-style-type: none">• 2 required if over 10,000 GT• Operate independently• ARPA acquires targets | |
| <input type="checkbox"/> | Compasses | 46 CFR 32.15-35
33 CFR 164.35
SOLAS 74/78 V/12 |
| | <ul style="list-style-type: none">• Illuminated gyrocompass with repeater at stand• Illuminated magnetic compass• Current deviation table | |
| <input type="checkbox"/> | Test electronic depth sounding device and recorder | 46 CFR 32.15-10
33 CFR 164.35
SOLAS 74/78 V/12 |
| | <ul style="list-style-type: none">• Accurate readout• Test all transducers• Continuous recorder (chart) | |
| <input type="checkbox"/> | Speed and distance indicator | 33 CFR 164.40
SOLAS 74/78 V/12 |
| <input type="checkbox"/> | Propulsion shaft tachometer | SOLAS 74/78 V/12 |

Notes: _____

- | | |
|--|--|
| <input type="checkbox"/> Radio equipment <ul style="list-style-type: none"> • Radios, RDF, Loran • Electronic position fixing device tested • GMDSS meets requirements for vessel operating area | 47 CFR Part 80
33 CFR 26.03
SOLAS 74/78 V/7
SOLAS 74/78 V/12
33 CFR 164.41
NVIC 9-93 |
| <input type="checkbox"/> Internal communications and control system <ul style="list-style-type: none"> • EOT failure alarms • Telephones • Voice tubes • Emergency loudspeaker system • Public address system • Bell pulls • Pilothouse controls | 46 CFR 113.30
46 CFR 113.35
MSM Ch. B1.J.4

46 CFR 32.30-1

46 CFR 113.50 |
| <input type="checkbox"/> Navigation lights and signals <ul style="list-style-type: none"> • Control panels • Running lights • Anchor lights • Special day and night signals • Distress signals and stowage • Flag signals, international code • Whistle, light, bells, gongs • Day and night signal devices • Certificate of Alternate Compliance | 72 COLREGS
46 CFR 111.75-17
MSM Ch. B1.J.5.c
MSM Ch. C2.J

46 CFR 32.15-5

33 CFR 81.9 |
| <input type="checkbox"/> Steering gear <ul style="list-style-type: none"> • Main gear tested (all stations) • Auxiliary gear tested (all stations) • Instructions and markings • Rudder angle indicator • Illumination • Alarms • Block diagram | 46 CFR 31.10-15
46 CFR 61.20-1
46 CFR 58.25
33 CFR 164.35
33 CFR 164.39
46 CFR 113.43
SOLAS 74/78 II-1/29
SOLAS 74/78 II-1/30
SOLAS 74/78 V/19-1
SOLAS 74/78 V/19-2
MSM Ch. C4.F
NVIC 1-69
NVIC 1-81 |

Notes: _____

- Maneuvering facts sheet with warning statements 33 CFR 164.35
- EPIRB (406 MHz) SOLAS 74/78 IV/7.1.6
46 CFR 199.510
NVIC 2-93
 - Float-free arrangement
 - Battery date current
 - Hydrostatic release
- GMDSS lifeboat radios (VHF) SOLAS 74/78 III/6.2
NVIC 9-93
 - 3 if over 500 GT
 - Operable condition
- 9 GHz radar transponder (SART) SOLAS 74/78 III/6.2
NVIC 9-93
 - Vessels > 300 GT and < 500 require 1
 - Vessels > 500 GT require 2
 - Stowed so to be rapidly placed in survival craft, or stowed in survival craft
- NAVTEX SOLAS 74/78 IV/7.1.4

General Health and Safety:

- Hospital and first aid equipment 46 CFR 32.40-35
- Operating room explosion-proof 46 CFR 111.105-37
- Emergency lighting 46 CFR 112.43
46 CFR 35.10-15
SOLAS 74/78 II-2/43.2
- Crew accommodations 46 CFR 32.40
 - Size
 - Lighting and wiring
 - Heating
 - Ventilation
 - Sanitation 46 CFR 31.10-45
 - Screens
 - Insulation
 - Fire retardant

Notes: _____

- Galley MSM Ch. B1.N.8
 - Equipment
 - Sanitation
 - Ventilation

- Means of escape from accommodation, machinery, and other spaces 46 CFR 32.02-1
SOLAS 74/78 II-2/45
 - Two required (some exceptions)
 - Dead end corridors
 - Absence of locks

- Notices and markings where required 46 CFR 35.40
 - Conspicuous
 - Legible
 - Proper size

- Gas freeing for repairs MSM Ch. A5.H
 - Current Gas Chemist Certificate for areas as required
 - Date _____
 - Chemist No. _____

- Paint stowage 46 CFR 32.85
SOLAS 74/78 II-2/18.7
 - Closures
 - Fireproof / metal lined
 - Lighting / electrical
 - Fire protection
 - Markings

- Storerooms
 - Stowage
 - Fire hazards
 - Lighting and wiring

- Oxygen sensor (oxygen analysis equip.) SOLAS 74/78 VI/3.1

- Combustible gas indicator 46 CFR 35.30-15
NVIC 12-86

- LPG systems, cylinders, tests 46 CFR 61.15-10

Notes: _____

- Pilot ladder and hoists in good condition
 - Illumination
 - Spreaders
 46 CFR 32.90-1
SOLAS 74/78 V/17
- Intrinsically safe portable radios
 46 CFR 35.30-30
- Safe access to tanker bows
(vessels built prior to 1 JUL 98 not required to comply until 1 JUL 2001)
 SOLAS 74/78 II-1/3-3

Structural Integrity:

- Hull structure (list inaccessible compartments or areas)
 - Decks
 - Shell
 - Bulkheads
 - Tank tops
 - Strength members
 - Approved plans on board
 46 CFR 31.10-15
ICLL 66 Reg. 1
- Hull openings and closures
 - Side ports
 - Air ports and dead covers
 - Refuse chutes
 - Cargo tank hatches
 - Butterworth plates
 - Closing devices, gaskets
 - Light / water test
 46 CFR 31.10-22
46 CFR 42.13-20
46 CFR 42.15
MSM Ch. B1.E.5
ICLL 66 Regs. 12 - 23
NVIC 5-82
NVIC 10-82, Change 1
- Deck openings and closures
 - Closing devices
 - Gaskets
 - Light / water test
 MSM Ch. B1.E.5
ICLL 66 Regs. 12 - 20
- Guards, ladders, rails, and gangways
(including accommodation ladders or pilot ladders)
 46 CFR 32.02-10
46 CFR 32.02-15
ICLL 66 Reg. 25

Notes: _____

- Catwalks, lifelines at hazardous places, cable traveler 46 CFR 32.02-10
- Elevators 46 CFR 111.91
- Watertight doors in subdivision bulkhead tested by:
 - 46 CFR 111.97
 - 46 CFR 170.248
 - 46 CFR 170.270
 - Local and remote control
 - Alarms
 - Markings
- Cargo gear examined (in absence of Cargo Gear Certificate) 46 CFR 31.10-16
46 CFR 31.37
 - Records
 - Safe Working Load markings
- Exercise valves and controls 46 CFR 38.10
 - Bilge valves
 - Overboard discharge valves
 - Equalizing valves
 - Emergency shutoff valves
 - Scupper valves
 - Remote control
 - Reach rods
- Bilge wells, cofferdams, and suction 46 CFR 56.50-50
- Bulkhead penetrations MSM Ch. B1.E.6
- Piping protection MSM Vol. IV Ch. 3.G.2.b
 - Removable guards (where required)
 - Baggage spaces
- Hull marks 46 CFR 67.120
 - Name 46 CFR 32.05-10
 - Hailing port
 - Official number
 - Net tonnage

Notes: _____

- Draft marks 46 CFR 32.05-1
 - Legible
 - Properly sized
 - Properly spaced
- Load line marks 46 CFR 31.25-1
46 CFR 42.07-5
46 CFR 42.13-20
ICLL 66 Regs. 4 - 9
 - Conform to certificate
 - Legible

Ground Tackle:

- Anchors 46 CFR 32.15-15
ABS Rules
 - Tested
 - Windlass
 - Capstans
 - Automatic tensioning device
- Mooring, standing and running gear (other than gear covered by Cargo Gear Certificate) 46 CFR 32.15-15
ABS Rules
- Emergency towing arrangements (vessels ≥ 20,000 DWT only) SOLAS 74/78 II-2/3-4
 - Approved by Administration

Cargo Operations:

- Warning notices and signals posted 46 CFR 35.30-1
- Pumprooms / pumps 46 CFR 32.60-20
46 CFR 32.50-1
46 CFR 35.35-70
 - Pumps and controls 46 CFR 32.55-45
 - Relief valves 46 CFR 32.55-1
 - Cofferdams 46 CFR 32.50-1
 - Ventilation 46 CFR 32.50-1
 - Bulkhead penetrations 46 CFR 32.52-5
 - Bilges clean
 - Free of excessive vapors
 - Closures 46 CFR 34.15-35
 - Remote shutdown 46 CFR 32.50-35
 - Electrical controls outside compartment 46 CFR 111.105

Notes: _____

- ☐ Cargo tanks
 - Trunks and hatches
 - Ullage openings
 - Liquid level gauges
 - Open
 - Restricted
 - Closed
 - Liquid level devices
 - Deck penetrations
 - Heating coils
 - Explosion-proof electrical fittings
 - Overfill device
- ☐ Cargo piping
 - Expansion joints
 - Controls
 - Supports
 - Hoses
 - Valves
- ☐ Hoses
 - External examination
 - Hydrostatic test
 - Markings
- ☐ Cargo oil containment
 - Size
 - Drains
 - Scupper closures

46 CFR 32.20-20
46 CFR 39.20-3

46 CFR 32.22T
46 CFR 32.50-15
46 CFR 111.105
33 CFR 155.840

46 CFR 32.50-15
33 CFR 156.170
46 CFR 56.30
46 CFR 56.35
46 CFR 56.20

46 CFR 32.50-30
33 CFR 155.800
33 CFR 156.170
33 CFR 154.500

33 CFR 155.310
SOLAS 74/78 II-2/59

Notes: _____

- Cargo tank venting 46 CFR 32.55-20
 - Common header system
 - P/V valves
 - Flame arrestors 46 CFR 32.20-5
 - Flush and drain connections 46 CFR 32.20-10
 - Inert gas controls 46 CFR 151.15-5
 - Piping
 - Independent PV valves 46 CFR 32.55-20
 - Flame screen 46 CFR 32.20-10
 - Independent goosenecks 46 CFR 32.55-25
 - Flame screen 46 CFR 32.20-10
 - Closure device

- Explosion-proof fixtures 46 CFR 111.105

- Independent tanks 46 CFR 32.60-30
 - External examination _____ 46 CFR 153.251
 - Date of internal examination _____
 - Date of hydrostatic test _____
 - Saddles; foundation and stowage
 - Piping and valves
 - Relief valves
 - Securing devices
 - Cargo hose
 - Electrical grounding
 - Authorized cargo

- Weather decks 46 CFR 111.105
 - Sources of vapor ignition
 - Doors, ports, scuttles,, gaskets, and closures satisfactory 46 CFR 32.56-21
 - Portable window air conditioners and fans
 - Ventilation systems

- Air compressor intakes 46 CFR 32.35-15
 - Prohibited locations

Notes: _____

Inert Gas Systems:

- Purity of nitrogen _____ 46 CFR 32.53
SOLAS 74/78 II-2/62
MSM Ch. C5
- % concentration of nitrogen in
vapor space _____
- % oxygen vapor _____
- Provisions for hold space and tank pad
- Sampling / testing of gas pad
- Gas generator or spare gas on board 46 CFR 32.53-20
- General
 - Supply capacity adequate
 - Positive pressure 46 CFR 32.50-30
 - Independent blowers 46 CFR 32.53-45
 - Oxygen detector and recorder 46 CFR 32.53-60
 - Pressure indicator and recorder
 - Portable detecting instruments
 - Alarms and controls 46 CFR 32.53-70
 - High oxygen alarm (> 8%)
 - Low pressure alarm (< 100mm)
 - Loss of water supply to deck water seal alarm
and shutdown
 - High inert gas temperature (> 150°F) alarm and
shutdown
 - Loss of water supply to scrubber alarm and
shutdown
 - Automatic shutdown valve 46 CFR 32.53-75
 - Instruction manual 46 CFR 32.53-85

Vapor Control Systems:

- Piping 46 CFR 39.20-1
 - Drain lines
 - Electrically bonded to hull
 - Flange stud
 - Vapor connection painted red / yellow / red and
labeled vapor in 2-inch black letters

Notes: _____

- Closed gauging arrangement 46 CFR 39.20-3
- Liquid overflow protection 46 CFR 39.20-9
 - High-level and tank overflow alarms
 - Alarm with automatic shutdown system
 - Spill valve
 - Rupture disk
 - Intrinsically safe
 - Audible and visual alarms
 - Operational test

Lifesaving Equipment:

NOTE: Exemptions and alternatives for vessels not subject to SOLAS can be found in 46 CFR 199.600.

- General alarms 46 CFR 32.25
46 CFR 113.25
SOLAS 74/78 III/6.4
 - Controls
 - Batteries and fuses
 - Tested
 - Markings 46 CFR 35.40
 - Bell locations audible
- Type of lifeboat
 - Davit launched
 - Free fall
- Lifeboats stripped, cleaned and inspected 46 CFR 199.190(f)
 - Date of annual servicing _____
- Lifeboats and work boats
 - Hull and fittings 46 CFR 199.201
 - Tanks and fittings 46 CFR 199.202
 - Cradles 46 CFR 199.261
 - Gripes 46 CFR 199.262
 - Compressed air cylinders SOLAS 74/78 III/19.2
 - Markings SOLAS 74/78 III/26
 - MSM Ch. C.2.H.2
 - 46 CFR 199.176

Notes: _____

Lifeboat equipment and stowage
(use table below to determine required equipment)

46 CFR 199.175
SOLAS 74/78 III/41

Item Number	Item	International Voyage		Short International Voyage	
		Lifeboat	Rescue Boat	Lifeboat	Rescue Boat
1	Bailer ¹	1	1	1	1
2	Bilge pump ²	1		1	
3	Boathook	2	1	2	1
4	Bucket ³	2	1	2	1
5	Can opener	3		3	
6	Compass	1	1	1	1
7	Dipper	1		1	
8	Drinking cup	1		1	
9	Fire extinguisher	1	1	1	1
10	First aid kit	1	1	1	1
11	Fishing kit	1			
12	Flashlight	1	1	1	1
13	Hatchet	2		2	
14	Heaving line	2	2	2	2
15	Jackknife	1		1	
16	Knife ^{1,4}		1		1
17	Ladder	1	1	1	1
18	Mirror, signalling	1		1	
19	Oars, units ^{5,6}	1	1	1	1
20	Painter	2	1	2	1
21	Provisions (units/persons)	1			
22	Pump ⁷		1		1
23	Radar reflector	1	1	1	1
24	Rainwater collection device	1		1	
25	Repair kit ⁷		1		1
26	Sea anchor	1	1	1	1
27	Searchlight	1	1	1	1
28	Seasickness kit (units/person)	1		1	

Item Number	Item	International Voyage		Short International Voyage	
		Lifeboat	Rescue Boat	Lifeboat	Rescue Boat
29	Signal, smoke	2		2	
30	Signal, hand flare	6		6	
31	Signal, parachute flare	4		4	
32	Skates and fenders ⁸	1	1	1	1
33	Sponge ⁷		2		2
34	Survival instructions	1		1	
35	Table of lifesaving signals	1		1	
36	Thermal protective aids ⁹	10%	10%	10%	10%
37	Tool kit	1		1	
38	Tow line ¹⁰	1	1	1	1
39	Water (liters/person)	3		3	
40	Whistle	1	1	1	1

Footnotes:

- 1 Each rigid liferaft equipped for 13 persons or more must carry two of these items.
- 2 Not required for boats of self-bailing design.
- 3 Not required for inflated or rigid-inflated rescue boats.
- 4 A hatchet counts towards this requirement in rigid rescue boats.
- 5 Oars are not required on a free-fall lifeboat; a unit of oars means the number of oars specified by the boat manufacturer.
- 6 Rescue boats may substitute buoyant paddles for oars, as specified by the manufacturer.
- 7 Not required for a rigid rescue boat.
- 8 Required if specified by the boat manufacturer.
- 9 Sufficient thermal protective aids are required for at least 10% of the persons the survival craft is equipped to carry, but not less than two.
- 10 Required only if the lifeboat is also the rescue boat.

Notes: _____

- | | | |
|--------------------------|---|--|
| <input type="checkbox"/> | Disengaging apparatus examined or tested and marked as required* | 46 CFR 199.45(b)
SOLAS 74/78 III/41
MSM Ch. C2.H.b |
| | <ul style="list-style-type: none"> • Universal joints • Safety latches • Hooks • Locking knuckles • Frame | |
| <input type="checkbox"/> | Motor lifeboats* | 46 CFR 199.45(b)
SOLAS 74/78 III/41
MSM Ch. C2.H.2 |
| | <ul style="list-style-type: none"> • Engine operating test • Cooling water pump • Ahead and astern test • Fuel tanks • Searchlight test (passenger vessels) • Annual fuel changed • Extinguishers serviced | |
| <input type="checkbox"/> | Hand-propelled lifeboats* | 46 CFR 199.45(b) |
| | <ul style="list-style-type: none"> • Flemming gear • Transmission oil | |
| <input type="checkbox"/> | Radio installation for lifeboats complies with FCC and/or international convention (where required)* | 46 CFR 199.60
SOLAS 74/78 III/6 |
| | <ul style="list-style-type: none"> • Portable • Fixed | |
| <input type="checkbox"/> | Lifeboat operational test* | 46 CFR 199.45(b)
SOLAS 74/78 III/19
MSM Ch. C2.H.2.b |
| <input type="checkbox"/> | Davits | 46 CFR 160.032
SOLAS 74/78 III/48
MSM Ch. C2.H.2.b |
| | <ul style="list-style-type: none"> • Foundations • Moving parts • Fittings • Fairleads, cleats, or cruciform bits | |
| <input type="checkbox"/> | Falls (date last renewed or end-for-ended) | 46 CFR 199.190(j)
SOLAS 74/78 III/48
MSM Ch. C2.H.8 |

* Items tested in conjunction with Abandon Ship Drill.

Notes: _____

- Lifeboat winches
 - Brakes
 - Controls
 - Cranks
 - Covers
 - Limit switches and electrical controls

46 CFR 199.199(i)
SOLAS 74/78 III/19
MSM Ch. C2.H.2.b

- Embarkation aids
 - Ladders
 - Access
 - Spans and lifelines
 - Illumination
 - Frapping and tricing lines

46 CFR 199.190(f)
SOLAS 74/78 III/11

- Lifeboat weight test
 - Light load
 - Full load: date _____

46 CFR 199.45(b)
SOLAS 74/78 III/19
MSM Ch. C2.H.6

- Liferrafts
 - Launching instructions posted
 - Equipment and stowage
 - Annual service dates
- _____
- _____
- _____

46 CFR 199.190
SOLAS 74/78 III/19
SOLAS 74/78 III/26
MSM Ch. C2.H.3
46 CFR 199.190(g)

- Hydro release service dates
- _____
- _____
- _____

46 CFR 199.190(h)

- Weak link
- Float free
- Illumination
- Markings
- Capacities
- Launching devices tested

MSM Ch. 6.R.3.d

Notes: _____

- Immersion suits
 - Condition
 - Retro-reflective material
 46 CFR 199.273
 SOLAS 74/78 III/27.3
 SOLAS 74/78 III/30.2.7
 MSM Ch. C.2.H.5
- Placard of lifesaving signals
 46 CFR 35.12
 SOLAS 74/78 V/16
- Pilot ladder and hoists in good condition
 46 CFR 32.90-1
 SOLAS 74/78 V/17
- Station bill posted
 46 CFR 35.10-1
 46 CFR 199.80
 SOLAS 74/78 III/8.3
- Distress signals
 46 CFR 199.60
 SOLAS 74/78 III/6.3
 - 12 rocket parachute flares

Fire Protection Equipment:

- Fire control plan
 46 CFR 35.10-3
 SOLAS 74/78 II-2/20
 - Permanently posted
 - Copy permanently stored in weathertight container outside deckhouse
- Portable extinguishers
 46 CFR 34.05-10
 46 CFR 34.50
 46 CFR 31.10-18(a)
 SOLAS 74/78 II-2/6
 SOLAS 74/78 II-2/21
 MSM Ch. C.2.I.3
 NVIC 7-70
 NVIC 13-86
 - Annually serviced
 - Bottles hydrostatically tested (every 5 years)
 - Markings (weight and hydrostatic test date)
 - Spare charges, spare extinguishers
- Semiportable extinguishers
 46 CFR 34.05-10
 46 CFR 34.50
 46 CFR 31.10-18(a)
 SOLAS 74/78 II-2/6
 SOLAS 74/78 II-2/21
 MSM Ch. C.2.I.4
 NVIC 13-86
 - Annually serviced
 - Bottles hydrostatically tested (every 12 years)
 - Controls, instructions, markings
 - Hose and diffuser
 - Flexible loops tested or replaced (same as bottle)

Notes: _____

- Fixed fire extinguishing systems**
 - Controls, instructions, marking 46 CFR 34.05-5
 - Alarms tested 46 CFR 34.15
 - Piping 46 CFR 34.17
 - Heads, distribution SOLAS 74/78 II-2/21
 - Bottles weighed annually MSM Ch. C2.I
 - Bottles hydrostatically tested (every 12 years) NVIC 6-70
 - Flexible loops tested or replaced (10% per year) NVIC 6-72, Change 1
 - Deck foam system NVIC 8-73
 - Sea suction, strainers 46 CFR 31.10-18(a)
 - Fixed system tested 46 CFR 34.20
 - Storage space / door SOLAS 74/78 II-2/61

Type of system: (circle appropriate type)			
Low Pressure CO ₂	High Pressure CO ₂	Halon	Foam

- Foam tanks** 46 CFR 34.17
 - Markings 46 CFR 35.40-10
 - Test SOLAS 74/78 II-2/61
 - Analysis NVIC 6-72
 - Refilled NVIC 11-82
 - Polar / non-polar foam
 - Cargo compatible

- Fire main system**
 - Pumps 46 CFR 34.05
 - Piping 46 CFR 31.10-18(g)
 - Cut-off valves 46 CFR 34.10-5
 - Drains 46 CFR 31.10-18(f)
 - 46 CFR 34.10-15(c)
 - NVIC 6-72, Change 1
 - SOLAS 74/78 II-2/4
 - SOLAS 74/78 II-2/21
 - MSM Ch. C2.I.9
 - MSM Ch. C2.I.8

Notes: _____

- Fire stations
 - Hydrants (2 effective streams) 46 CFR 34.10-10
NVIC 6-72, Change 1
 - Nozzles and spanners SOLAS 74/78 II-2/4
 - Fog applicators (<6 feet in length, in engine room) SOLAS 74/78 II-2/21
 - MSM Ch. 18.1.9
 - Hose MSM Ch. 19.1.7
 - UL approved 46 CFR 34.25-20
 - Correct length
 - Markings 46 CFR 32.05-5
 - Equipment compatible

- Total length of all hose tested _____ 46 CFR 34.10-10
 - Hydrostatically tested to at least 100 psi MSM Ch. 18.1.6
 - Proper threads 46 CFR 31.10-18(g)
 - Approved hose

- Structural fire protection 46 CFR 32.56
 - Bulkheads 46 CFR 32.57
 - Insulation 46 CFR 34.05
 - 46 CFR 34.10
 - 46 CFR 34.15
 - 46 CFR 35.10-3
 - SOLAS 74/78 II-2/42

- Fire doors and controls tested 46 CFR 32.56-35
 - Machinery space and stair towers 46 CFR 111.103-1
 - Not tied or blocked open SOLAS 74/78 II-2/46
 - Installed closure devices working SOLAS 74/78 II-2/47

- Remote controls to power ventilation marked and tested 46 CFR 111.103-1

- Closures for spaces protected by fixed smothering systems

- International shore connection 46 CFR 34.10-15(d)
SOLAS 74/78 II-2/19

- Fire axe 46 CFR 34.60
 - Markings 46 CFR 32.05-5

Notes: _____

- Firemen's outfits
 - Two lockers
 - Four outfits
 - Protective clothing
 - Helmet, boots, and gloves
 - Lamp
 - Axe
 - Self-contained breathing apparatus and lifeline
 - Spare charges

46 CFR 35.30-20
 SOLAS 74/78 II-2/17.3
 NVIC 2-63
 NVIC 4-68

- Water spray system
 - Coverage (all tank domes, cargo manifolds, deck tanks)
 - Operation
 - Local / remote control
 - Manual or automatic
 - Tested
 - Can operate simultaneously with fire main systems
 - Controls marked
 - Material condition

46 CFR 34.25

Pollution Prevention:

NOTE: Guidance for inspecting pollution prevention items is detailed in MSM Volume II, Chapter 31.

- Pollution placard posted 33 CFR 155.450
- MARPOL V placard posted 33 CFR 151.59
- Person-in-charge designation 33 CFR 155.700
33 CFR 155.820
- Fuel oil containment 33 CFR 155.320
 - Portable
 - Fixed
- Fuel tank vents 46 CFR 56.50-85
 - Flame screens
 - Closures

Notes: _____

- Oily waste retention
 - Bilge
 - Tank
 33 CFR 157.17
MSM Ch. B6.D.7

- Ballast discharge
 - Acceptable processing equipment
 33 CFR 155.330
33 CFR 155.350
33 CFR 155.360
33 CFR 155.370
MSM Ch. B6.D.10

- Oily bilge discharge
 - Piping system
 - Stop valve
 - Standard discharge connection
 - Pump stop
 33 CFR 155.380

33 CFR 155.430

- Prohibited oil spaces
 33 CFR 155.470

- Emergency shutdown
 33 CFR 155.780

- Discharge removal equipment
 - Sorbents
 - Non-sparking tools
 - Containers
 - Emulsifiers
 - Protective clothing
 - Scupper plugs
 - Non-sparking portable pump
 33 CFR 155.205
33 CFR 155.210

- Deck lighting
 33 CFR 155.790

- Garbage
 - Shipboard garbage properly disposed
 33 CFR 151.63
MARPOL Ax. V/3

- Discharge from machinery space bilges
 - Approved monitoring and control system
 - Approved oil water separating equipment
 33 CFR 151.10

Notes: _____

- MARPOL Annex I survey 33 CFR 151.09
 - Discharge of cargo residue
 - Approved monitoring and control system
- MARPOL Annex II survey 33 CFR 151.30
 - Discharge of cargo residue
 - Approved monitoring and control system

Marine Sanitation Devices:

NOTE: Guidance for inspecting marine sanitation devices is detailed in MSM Volume II, Chapter C2.K.

- Marine sanitation device 33 CFR 159.55
MSM Ch. B6.F
 - Type I
 - Type II
 - Type III
- Certified for inspected vessels MSM Ch. B6.F.4
- Capacity satisfactory MSM Ch. C2.K.7.d
- Installation 33 CFR 159.57
MSM Vol. IV Ch. 3.K.1
 - Operation
 - Ventilation
 - Wiring and piping
 - Maintenance
 - Placard posted 33 CFR 159.59
 - Safety
 - Accessibility to parts requiring routine servicing
 - Manufacturer's instructions available

Notes: _____

Section 4: Additional Inspection Items for Vessels Carrying Dangerous Chemicals in Bulk

Emergency Equipment:

- Safety gear lockers
 - Proper locations (minimum of 2)
 - Labeled "Safety Equipment"
 - Proper type and amount of safety equipment 46 CFR 153.214

Equipment	Amount Required per Safety Gear Locker Location	
	Primary Shutdown Station	Secondary Shutdown Station
2 stretchers with lifting equipment	1	1
30-minute SCBA	3	2
SCBA refill tanks	11	6
First aid equipment	2	1
Overalls or long apron	2	1
Boots	2	1
Long-sleeved gloves	2	1
Goggles	2	1
Steel-cored lifeline with harness	2	1
Explosion-proof flashlight	2	1

- Self-contained breathing apparatus
 - Material condition
 - Operation
- Decontamination showers and eye wash on deck 46 CFR 153.216
 - Operation
 - Suitably marked

Notes: _____

- Crew respiratory / eye protection 46 CFR 153.527
 - EEBD > 15-minute duration

Cargo Operations:

- Warning signs and signals
 - Red signal visible, light / flag 46 CFR 153.953
 - Warning signs at gangway 46 CFR 153.955
 - “Warning”
 - “Dangerous Cargo”
 - “No Smoking”
 - “No Open Lights”
- Portable cargo hose 46 CFR 153.940
 - Marked or stenciled
 - Date
 - Tested
 - Test pressure
 - MAWP
 - Service temperature
 - Maximum
 - Minimum
 - Test pressure
- Cargo discharge methods
 - Pumproom
 - Deepwell pump
 - Submerged pump
 - Gas pressurization 46 CFR 153.964
 - Liquid displacement 46 CFR 153.966

Cargo Tanks:

- Trunks and hatches, ullage openings 46 CFR 153.256
 - Condition
 - Gaskets
 - Closure
 - Butterworth openings
 - Closed
 - Fitted with flame screens

Notes: _____

- Special tank linings 46 CFR 153.266
- Heating system 46 CFR 153.430
 - If toxic cargoes only, system must be separate from vessel's heating system and contamination detection must be available
- Cooling system 46 CFR 153.432
- Cargo high pressure and temperature alarms 46 CFR 153.438
 - Audible
 - Visual
 - Location

Cargo Piping:

- Material condition
 - Annual hydrostatic test 33 CFR 156.170
 - Properly marked 46 CFR 15.294
- Valves 46 CFR 153.283
 - Tank valves
 - Hose connection points
- Agreement with plans 46 CFR 153.910
 - New piping
 - No unauthorized modification
- Prohibited materials 46 CFR 153.236
 - Aluminum or aluminum alloys
 - Copper or copper alloys
 - Zinc, galvanized steel, or alloys having > 10% zinc
 - Magnesium
 - Lead
 - Silver or silver alloys
 - Mercury

Notes: _____

Quick-closing Valves:

NOTE: Requirements for quick-closing valves are detailed in 46 CFR 153.284.

- Operation
 - Tested from at least 2 remote locations
 - Closure time < 30 seconds
 - All valves fully closed
 - Pumps automatically shut off
- Capable of local manual operation
 - Reasonably short time
 - Under emergency conditions
- Fusible elements
 - Located at tank domes and loading manifold
 - No paint on face of plug

Venting:

- Type of vent system
 - Open, gooseneck
 - P/V 46 CFR 153.355
 - High velocity 46 CFR 153.353
- Vent piping
 - No stop valves allowed
 - Bypass capability 46 CFR 153.361
 - Material condition
 - Segregation
 - Independent
 - Common
 - Portable
 - Agreement with plans
 - Suitable connections for flushing and draining 46 CFR 153.362
 - Coated or lined same as tank
 - Prohibited materials 46 CFR 153.236

Notes: _____

- Vent outlets
 - Height above highest cargo area working level
 - Directed vertically upward
 - Flame arrestor (where required)
 - Weather hood
 - Flame screens
 - Located away from air intakes and openings to accommodation spaces
- P/V valves
 - Material condition
 - Operation
 - Flame screens

46 CFR 153.350
 46 CFR 153.351
 46 CFR 153.352

46 CFR 153.368

46 CFR 153.463

Gauging:

- Type of gauging system
 - Open
 - Restricted
 - Closed
- High-level alarms
 - Operation
 - Audible and visual signals
 - Last tested and inspected _____
 - Markings
- Overfill controls
 - Set points
- Cargo samples
 - Designated stowage locations
 - Ventilation

46 CFR 153.400

46 CFR 153.409

46 CFR 153.408

46 CFR 153.935(a)

Notes: _____

Pumprooms:

- Ventilation
WARNING: Pumproom must be adequately ventilated prior to personnel entry.
 - Forced exhaust 46 CFR 153.310
 - Termination of external openings 46 CFR 153.312
 - Intake below and above floor plates
 - Operable from outside pumproom
 - Adequate volume
 - Material condition of ducting

- Pumps
 - Pressure gauges outside pumproom and operable 46 CFR 153.333
 - Type of drive _____
 - Material condition

- Shaft seals (where motor rooms are installed)
 - Leakage
 - Vapor-tight
 - Adequate supply of oil (where required)

- General
 - Hoisting arrangement 46 CFR 153.332
 - Bilge pumping system 46 CFR 153.334
 - Operational
 - Remote controls
 - High-level alarm

Electrical Systems:

NOTE: Requirements for inspecting the following electrical items are detailed in Subchapter J as per 46 CFR 153.466.

- Explosion-proof lighting fixtures 46 CFR 111.105
 - Tight globe
 - Heavy construction
 - Explosion-proof seals around cables

Notes: _____

- Cable
 - Condition
- Electrical fixtures on deck NVIC 2-89
 - Explosion-proof or intrinsically safe
 - No frayed or exposed wires
 - Material condition

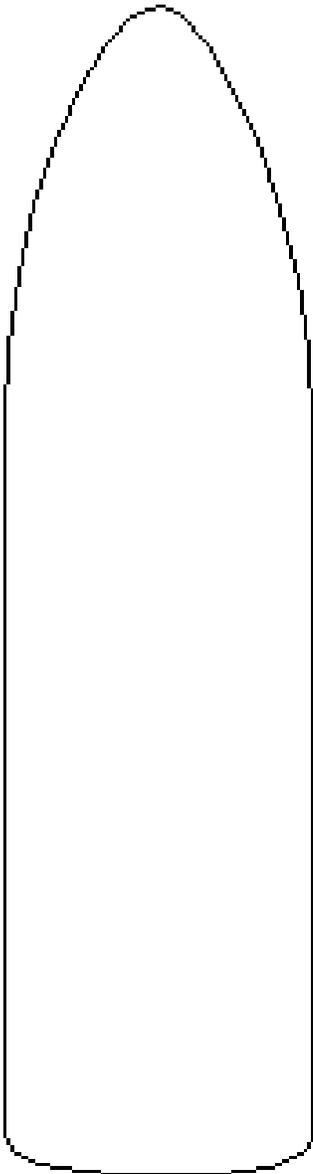
Gas Detection:

- Portable gas detectors
 - Number _____
 - Type
 - Flammable gas detectors 46 CFR 153.465
 - Calibrated
 - Tested
 - Toxic gas detectors 46 CFR 153.526
 - Capable of measuring all toxic cargoes authorized to be carried
 - Calibrated
- Fixed gas detectors 46 CFR 153.526
 - Calibration
 - Crew knowledgeable in operation
 - Span gas available
 - Zeroing
 - Calibration curves available for all cargoes carried
 - Tested

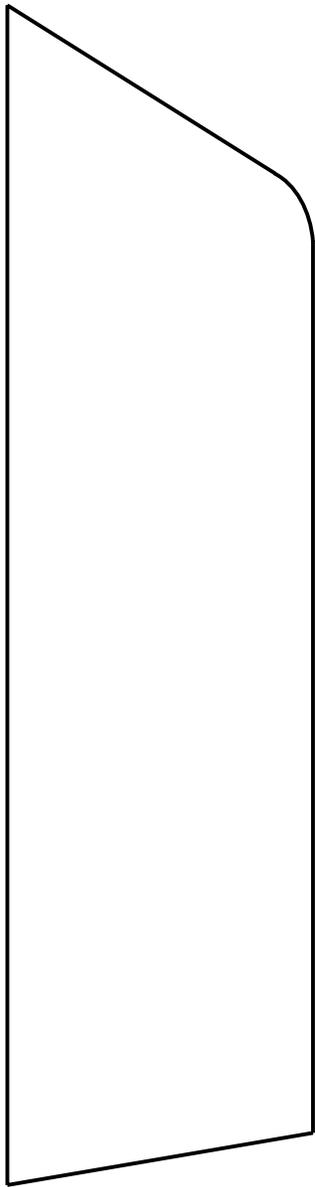
Notes: _____

Section 6: Appendices

Vessel Layout:



- Double hull / bottom / sides
- Ballast tanks (SBT/CBT)
- Chemical tank type: I II III
- Tank arrangement
- Deckhouse location
- External / internal framing
- Layout of pumps – type



Cargoes Requiring a Response Plan:

Type of Cargo	Name of Cargo		
Asphalt Solution	<ul style="list-style-type: none"> • Blending stocks 	<ul style="list-style-type: none"> • Roofers stock 	<ul style="list-style-type: none"> • Straight run residue
Animal Oils	<ul style="list-style-type: none"> • Tallow • Lard • Stearic acid 	<ul style="list-style-type: none"> • Olive acid • Sperm oil 	<ul style="list-style-type: none"> • Fish oil • Fish liver
Distillates	<ul style="list-style-type: none"> • Flashed feed stocks 	<ul style="list-style-type: none"> • Straight run 	
Easenal Oils	<ul style="list-style-type: none"> • Pinene 	<ul style="list-style-type: none"> • Turpentine 	<ul style="list-style-type: none"> • Dipentine
Edible Oils	<ul style="list-style-type: none"> • Corn • Coconut 	<ul style="list-style-type: none"> • Soybean • Olive 	<ul style="list-style-type: none"> • Cotton seed
Gasolines	<ul style="list-style-type: none"> • Automotive • Aviation • Casinghead 	<ul style="list-style-type: none"> • Polymer • Straight run • Gas, oil cracked 	<ul style="list-style-type: none"> • Akylates • Reformates
Naptha	<ul style="list-style-type: none"> • Aromatic • Cracking fraction • Heavy 	<ul style="list-style-type: none"> • Paraffinic • Petroleum • Solvent 	<ul style="list-style-type: none"> • Stoddard solvent • Varnish makers
Oils	<ul style="list-style-type: none"> • Clarified oil • Crude oil • Fuel oils [# 1 (Kerosene), # 2, # 2D, # 4, # 5, # 6] • Residual fuel oil • Transformer oil • Lube oil and blending stock 	<ul style="list-style-type: none"> • Aromatic oil (excluding vegetable oil) • Mineral oil • Motor oil • Penetrating oil • Spindle oil • Turbine oil • Octene 	<ul style="list-style-type: none"> • Olefin • Animal • Range • Residual • Resin • Road • White (mineral)

Prohibited Chemical Cargoes:

The following cargoes have been determined to be too hazardous to be carried in U.S. waters:

1. Acrolein
2. Chlorine (on self-propelled vessels)
3. Ethylenimine
4. Hydrofluoric Acid
5. Hydrogen
6. Hydrogen Chloride
7. Hydrogen Fluoride
8. Methylcyclopentadienyl Manganese Tricarbonyl
9. Nitric Acid (in concentrations > 70%)
10. Nitrogen Tetroxide
11. Oxygen
12. Phosphorus Trichloride
13. (Beta) Propiolactone

Recommended US Vessel Deficiency Procedures:

Step	Action								
1	Identify deficiency.								
2	Inform vessel representative.								
3	Record on the <i>Deficiency Summary Worksheet</i> (next page).								
4	If deficiency is corrected prior to end of inspection, go to Step 7.								
5	<p>If deficiency is unable to be corrected prior to end of inspection, issue CG-835 in accordance with table below.</p> <table border="1" data-bbox="224 993 930 1774"> <thead> <tr> <th data-bbox="224 993 578 1041">IF deficiency:</th> <th data-bbox="578 993 930 1041">THEN issue CG-835:</th> </tr> </thead> <tbody> <tr> <td data-bbox="224 1041 578 1283"> <p>Does NOT immediately impact crew/passenger safety, hull seaworthiness, or the environment, e.g.,</p> <ul style="list-style-type: none"> • Missing placards • Non-metallic expansion joints more than 10 years in service </td> <td data-bbox="578 1041 930 1283"> <p>That provides a specific time for correcting deficiency, e.g.,</p> <ul style="list-style-type: none"> • “X” number of days • At next drydock </td> </tr> <tr> <td data-bbox="224 1283 578 1472"> <p>Allows vessel operations to be MODIFIED to meet less stringent requirements, e.g.,</p> <ul style="list-style-type: none"> • Expired international certificates • Automation defect </td> <td data-bbox="578 1283 930 1472"> <p>That restricts operation of vessel to meet current vessel conditions, e.g.,</p> <ul style="list-style-type: none"> • Reduced route • Increased crew </td> </tr> <tr> <td data-bbox="224 1472 578 1774"> <p>DOES immediately impact crew/passenger safety, hull seaworthiness, or the environment, and cannot be modified to meet less stringent requirements, e.g.,</p> <ul style="list-style-type: none"> • Missing or defective firefighting equipment • Structural defect or damage </td> <td data-bbox="578 1472 930 1774"> <p>That requires the deficiency to be corrected prior to operating vessel (“NO SAIL” item), e.g.,</p> <ul style="list-style-type: none"> • Prior to carrying cargo </td> </tr> </tbody> </table>	IF deficiency:	THEN issue CG-835:	<p>Does NOT immediately impact crew/passenger safety, hull seaworthiness, or the environment, e.g.,</p> <ul style="list-style-type: none"> • Missing placards • Non-metallic expansion joints more than 10 years in service 	<p>That provides a specific time for correcting deficiency, e.g.,</p> <ul style="list-style-type: none"> • “X” number of days • At next drydock 	<p>Allows vessel operations to be MODIFIED to meet less stringent requirements, e.g.,</p> <ul style="list-style-type: none"> • Expired international certificates • Automation defect 	<p>That restricts operation of vessel to meet current vessel conditions, e.g.,</p> <ul style="list-style-type: none"> • Reduced route • Increased crew 	<p>DOES immediately impact crew/passenger safety, hull seaworthiness, or the environment, and cannot be modified to meet less stringent requirements, e.g.,</p> <ul style="list-style-type: none"> • Missing or defective firefighting equipment • Structural defect or damage 	<p>That requires the deficiency to be corrected prior to operating vessel (“NO SAIL” item), e.g.,</p> <ul style="list-style-type: none"> • Prior to carrying cargo
IF deficiency:	THEN issue CG-835:								
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<p>Allows vessel operations to be MODIFIED to meet less stringent requirements, e.g.,</p> <ul style="list-style-type: none"> • Expired international certificates • Automation defect 	<p>That restricts operation of vessel to meet current vessel conditions, e.g.,</p> <ul style="list-style-type: none"> • Reduced route • Increased crew 								
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6	Enter CG-835 data in MIDR.								
7	Enter deficiency data in MSDS.								
8	Initiate Report of Violation (ROV) if necessary.								

Conversions:

Distance and Energy					
Kilowatts (kW)	X	1.341	=	Horsepower (hp)	
Feet (ft)	X	3.281	=	Meters (m)	
Long Ton (LT)	X	.98421	=	Metric Ton (t)	
Liquid (NOTE: Values are approximate.)					
Liquid	bbbl/LT	m ³ /t	bbbl/m ³	bbbl/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	
Weight					
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 ³	1 psi	= .06895 Bar = 2.3106 ft of water		
Temperature: Fahrenheit = Celsius ($^{\circ}\text{F} = 9/5\text{ }^{\circ}\text{C} + 32$ and $^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$)					
0	= -17.8	80	= 26.7	200	= 93.3
32	= 0	90	= 32.2	250	= 121.1
40	= 4.4	100	= 37.8	300	= 148.9
50	= 10.0	110	= 43.3	400	= 204.4
60	= 15.6	120	= 48.9	500	= 260
70	= 21.1	150	= 65.6	1000	= 537.8
Pressure: Bars = Pounds per square inch					
1 Bar	= 14.5 psi	5 Bars	= 72.5 psi	9 Bars	= 130.5 psi
2 bars	= 29.0 psi	6 Bars	= 87.0 psi	10 Bars	= 145.0 psi
3 Bars	= 43.5 psi	7 Bars	= 101.5 psi		
4 Bars	= 58.0 psi	8 Bars	= 116.0 psi		