

United States Coast Guard



**ALTERNATE COMPLIANCE PROGRAM  
TANKSHIP (CHEMICAL/GAS)  
EXAMINATION BOOK**

<b>Name of Vessel</b>	
<b>Official Number</b>	<b>ACP Class Society</b>
<b>Date Completed</b>	<b>Location</b>
<b>Vessel Built in Compliance with SOLAS: 60 74 74/78 N/A</b>	
<b>Exam Type</b>	
Annual	Reexamination
<b>Inspectors</b>	
1. _____	3. _____
2. _____	4. _____

**Total Time Spent Per Activity:**

<b>Regular Personnel (Active Duty)</b>			
ACTIVITY TYPE	ACTIVITY	TRAINING	(PERS) MI

TOTAL ADMIN HOURS	TOTAL TRAVEL HOURS
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<b>Reserve Personnel</b>			
ACTIVITY TYPE	ACTIVITY	TRAINING	(PERS) MI

TOTAL ADMIN HOURS	TOTAL TRAVEL HOURS
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<b>Auxiliary Resources</b>	
TOTAL BOAT HOURS	TOTAL AIRCRAFT HOURS

## **Use of ACP Tankship (Chemical/Gas) Examination Book:**

This examination book is intended to be used as a job aid by Coast Guard marine inspectors during annual examinations and reexaminations of U.S. flagged vessels participating in the Alternate Compliance Program (ACP). This book contains an extensive list of possible examination items. It is not, however, the Coast Guard's intention to "inspect" all items listed. The marine inspector must verify that the vessel and its crew are in substantial compliance with international conventions and the requirements of the ACP class society's U.S. Supplement. The depth and scope of the examination must be determined by the marine inspector's observation of the vessel, its equipment, and its crew.

This document does not establish or change Federal laws or regulations. References given are only general guides. Refer to IMO publications, CFR's, the ACP class society's U.S. Supplement, NVIC's, or any locally produced cite guides for specific regulatory references. Although not all items in this book are applicable to all vessels, Section 1 should be filled out in its entirety at each examination and reexamination.

**NOTE:** *Guidance on how to examine ACP vessels can be found in MSM Volume II, Chapter B9: Alternate Compliance Program, and NVIC 2-95, Change 1. All MSM cites listed in this book refer to MSM Volume II unless otherwise indicated.*

## **Guide to Examinations:**

- Annual examination and reexamination
- Annual examination only
- Expanded examination as required

These three stages are only a general guide. Each marine inspector should determine the depth of the examination necessary. A checked box should be a running record of what has been examined by the marine inspector. It does not imply that the entire system has been examined or that all or any items are in full compliance.

**NOTE:** *A reexamination normally includes an examination of the vessel's documents, certificates, and licenses, in addition to a "walk-through" of the vessel.*

### **Pre-inspection Items**

- Review vessel computer (survey status) reports from the ACP class society.
- Review reports pertaining to conditions of class or statutory deficiencies
- Obtain copies of forms or certificates to be issued.

### **Post-inspection Items**

- Issue forms/certificates to vessel.
- Update MSIS with international certificate data.
  - VFOD      – MSDS
  - VFLD      – MIDR
  - MIAR
- 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**

**International Certificates:**

Name of Certificate	Issuing Agency	ID #	Port Issued/ Country	Issue Date	Exp. Date	Endors. Date
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<b>Certificate of Documentation</b> No Change	USCG					
<b>Classification Document</b> No Change						
<b>Certificate of Financial Responsibility (COFR)</b> No Change	USCG					
<b>Safety Construction (SLC)</b> No Change						
<b>Safety Equipment (SLE)</b> No Change						
<b>Safety Radio (SLT)</b> No Change						
<b>International Load Line (ILL)</b> No Change						

<b>Name of Certificates</b>	<b>Issuing Agency</b>	<b>ID #</b>	<b>Port Issued/ Country</b>	<b>Issue Date</b>	<b>Exp. Date</b>	<b>Endors. Date</b>
<b>International Oil Pollution Prevention w/Form B (IOPP)</b> No Change						
<b>IOPP for NLS Cargoes</b> No Change						
<b>Certificate of Fitness (COF)</b> No Change						
<b>International Tonnage (ITC)</b> No Change						
<b>Safety Management (SMC)</b> No Change						
<b>Document of Compliance (DOC)</b> No Change						
<b>Subchapter O Endorsement (SOE)</b> No Change	USCG					

**Manning:**

- Officers' licenses current STCW 95 I/2  
STCW 95 I/10  
STCW 95 VI/1  
STCW 95 VI/2
  
- Rest periods STCW 95 VIII/1
  - Review watch schedules

**Logs and Manuals:**

- Lifesaving equipment maintenance record 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 SOLAS 74/78 III/18.5
  - Weekly and lifeboat drills SOLAS 74/78 III/25
  
- Bridge log 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
  - Emergency steering drills
  
- Exemptions to SOLAS certificates SOLAS 74/78 I/4

Notes: \_\_\_\_\_  
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## **Pollution Prevention Records:**

- Current pollution prevention records
  - Person-in-charge 33 CFR 155.700
  - Transfer equipment tests and inspections 33 CFR 156.170
  - Declaration of Inspection 33 CFR 156.150
- ◇ Oil record book (spot-check) 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 flag state / class society
  - Contact numbers correct
  - Immediate Actions List
- ◇ Vessel response plan 33 CFR 155.1045  
(vessels carrying oil as secondary cargo) 33 CFR 155.1030
- ◇ Transfer procedures 33 CFR 155.720
  - Posted / available in crew's language
  - List of products carried by vessel
  - Description of transfer system including a line diagram of piping
  - Number of persons required on duty
  - Duties by title of each person
  - Means of communication
  - Procedures to top off tanks
  - Procedures to report oil discharges
  - VCS information 46 CFR 155.750
  - Amendments authorized
  - Transfer flag and light

## **Chemical Cargo Records:**

- Documents 46 CFR 153.901
  - Readily available
  - Free of alterations

Notes: \_\_\_\_\_  
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- Approved Procedures & Arrangement Manual      MARPOL Ax. II
- Cargo record book      MARPOL Ax. II/19
  - Proper format
  - Properly completed
- Cargo information      46 CFR 153.907
  - Cargo manifest
  - Procedures for spills / leaks
- Cargo location plan      46 CFR 153.907
  - Cargo compatibility      46 CFR Part 150
- Cargo piping plan      46 CFR 153.910
- Shipping document      46 CFR 153.907
- Waiver letters carried      46 CFR 153.10
- Certificate of inhibition or stabilization      46 CFR 153.912
  - Name and concentration \_\_\_\_\_
  - Date added to cargo \_\_\_\_\_
  - Length of time effective \_\_\_\_\_
  - Temperature limitations \_\_\_\_\_
  - Certificate states action to be taken if voyage exceeds useful life of the inhibitor / stabilizer
- Current copy of 46 CFR Parts 35, 150, and 153 aboard      46 CFR 153.905

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### Section 3: General Examination Items

#### Navigation Safety:

- Charts and publications for US waters/  
intended voyage 33 CFR 164.33
  - Current and corrected charts
  - US Coast Pilot
  - Sailing directions
  - Coast Guard Light List
  - Tide tables
  - Tidal current tables
  - International Rules of the Road
  - Inland Rules of the Road
  - International Code of Signals
  - Plotting equipment 33 CFR 164.35
- Radar(s) and ARPA 33 CFR 164.35
  - 2 required if over 10,000 GT 33 CFR 164.37
  - Operate independently 33 CFR 164.38
  - ARPA acquires targets
- Compasses 33 CFR 164.35
  - Illuminated gyrocompass with repeater at stand
  - Illuminated magnetic compass
  - Current deviation table
- Test electronic depth sounding device and recorder 33 CFR 164.35
  - Accurate readout
  - Test all transducers
  - Continuous recorder (chart)
- Electronic position fixing device 33 CFR 164.41
  - Location accurate

Notes: \_\_\_\_\_  
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- Indicators 33 CFR 164.35
  - Illuminated rudder angle indicator
  - Centerline RPM indicator
  - Propeller pitch (CPP systems)
  - Speed and distance indicators 33 CFR 164.40
  - Lateral thrusters
  
- Communications SOLAS 74/78 IV/6.3  
33 CFR 26.03
  - VHF radio
  
- Steering gear instructions 33 CFR 164.35
  - Instructions
  - Emergency instructions
  - Block diagram
  
- Maneuvering facts sheet with warning statement 33 CFR 164.35
  
- Radiotelephone (VHF-FM) SOLAS 74/78 IV/7  
33 CFR 26.03  
33 CFR 26.04
  
- EPIRB (406 MHz) SOLAS 74/78 IV/7.1.6
  - Float-free amount
  - Battery date current
  - Hydrostatic release
  
- GMDSS SOLAS 74/78 IV/8  
SOLAS 74/78 IV/9  
SOLAS 74/78 IV/10  
SOLAS 74/78 IV/11
  - Additional radio equipment for area of operation
  
- Operationally test bridge steering SOLAS 74/78 II/1-29
  - Test power/control pumps independently
  - Test follow-up and non-follow-up controls
  - Rudder angle indicator accurate
  - Activate loss of power alarm
  
- GMDSS lifeboat radios (VHF) SOLAS 74/78 III/6.2
  - 3 if over 500 GT
  - Operable condition

Notes: \_\_\_\_\_

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- ◇ 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
- ◇ Radio installation SOLAS 74/78 IV/6.2
  - Marked with call sign

## **General Health and Safety**

- Accident Prevention and Occupational Health
  - Rails, guards, protective clothing and equipment, warning signs posted in crew work areas
- Crew accommodations 46 CFR 32.40
  - Habitable conditions
  - Adequate lighting and ventilation
  - Free of cargo and stores
  - Individual berths
- Hospital space 46 CFR 32.40
  - Designated for ships  $\geq 500$  GT with 15 or more crew on voyage of more than 3 days
  - Not used for stowage or berthing
  - Properly operating toilet
- Galley MSM Ch. 6.P.8
  - Sanitary conditions
  - Adequately equipped to prepare food
  - Mess hall provided for crew
- Muster lists and emergency instructions
  - Available for each person SOLAS 74/78 III/8
  - Posted in conspicuous places
  - Shows crew member duties SOLAS 74/78 III/53

Notes: \_\_\_\_\_

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- Safe access to tanker bows SOLAS 74/78 II-1/3-3  
(vessels built prior to 1 JUL 98 not required to comply until 1 JUL 2001)

**Structural Integrity**

*NOTE: Request records of Outstanding Conditions of Class. (Form or format may vary depending on classification society.) Conditions of Class may identify structural defects, wastage, etc. Conditions may also identify ships overdue for drydocking, repair or other required service.*

- Hull structure ICLL 66 Reg. 1
  - Frame pulling away
  - Fractures in corners
  - Holes in main decks
  - Leaks / patching on ballast tanks
  - Bulkheads / decks warped
  - Excessive wastage
  
- Side shell, accessible structural members, decks, and superstructure ICLL 66 Reg. 1
  - Fractures, corrosion, wastage, pitting or damage to the extent that it may impair ship's seaworthiness
  - Excessive doublers, postage stamp inserts, cement boxes or soft patches
  - Welding burn marks or other evidence of recent repair work
  - Load line marked in accordance with certificates ICLL 66 Regs. 4 - 9
    - Hailing port
    - Name
  - Railings
  
- Watertight/weathertight openings
  - Watertight doors, gaskets, dogs ICLL 66 Reg. 12
  - Other openings (means of securing) ICLL 66 Regs. 13 - 18
  - Vents, air pipes and closing appliances ICLL 66 Regs. 19 & 20

Notes: \_\_\_\_\_  
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**Ground Tackle:**

- Emergency towing arrangements (vessels ≥ 20,000 DWT only) SOLAS 74/78 II-1/3-4
  - Approved by Administration
- ◇ Anchor and windlass (spot-check)
  - Foundations
  - Drive units
  - Guards
  - Covers for moving parts
  - Brake pads
  - Deck fittings
  - Electrical (wiring) or hydraulic piping
- ◇ Mooring winches / capstans
  - Foundations
  - Cables / hooks
  - Boom
  - Brake
  - Electrical (wiring) or hydraulic piping
  - Ladders / rails

**Lifesaving Equipment:**

- Lifeboats / rescue boats
  - Required number SOLAS 74/78 III/26
  - Hull integrity and fittings SOLAS 74/78 III/19.2
  - Engine starts within 5 minutes
    - Test engine at drill

**NOTE:** Do NOT test free fall lifeboat engine.

<b><u>Stbd Lifeboat</u></b>	<b><u>Port Lifeboat</u></b>	<b><u>Lifeboats</u></b>
Engine equipped	Engine equipped	Wooden
Engine tested	Engine tested	Fiberglass
Lifeboat lowered	Lifeboat lowered	Steel
		Covered
Free fall lifeboat with rescue boat		

Notes: \_\_\_\_\_  
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- Davit system
  - Structure and foundation
  - Roller tracks
  - Lubrication (evidence of use)
  - Falls; end for end / renew (2.5 / 5 years)
  - No obstructions to lowering
  
- Embarkation area
  - No obstructions
  - Embarkation ladder
  - Launching instructions
  - Emergency lighting
  
- Liferafts
  - Required number
  - Stowage
  - Float-free arrangement
    - Hydrostatic release / weak link
  - Annual servicing (hydrostatic release and inflatable liferaft)
    - Maximum 17 months
  - Launching instructions posted
  - Bow / stern station
    - Lashed down on deck or in marked location
    - Lifejackets available
  
- Lifebuoys (spot-check)
  - Condition
  - Bridge location
    - Quick release system
    - Smoke and light float
  - Deck location
    - 50% with waterlights
  - Retro-reflective tape

SOLAS 74/78 III/19.2  
SOLAS 74/78 III/48

SOLAS 74/78 III/11.7

SOLAS 74/78 III/9

SOLAS 74/78 III/19

SOLAS 74/78 III/26

SOLAS 74/78 III/29

SOLAS 74/78 III/19.8.1  
SOLAS 74/78 III/19.9.1

SOLAS 74/78 III/9

SOLAS 74/78 III/19.2

SOLAS 74/78 III/7.1

SOLAS 74/78 III/30.2.7

Notes: \_\_\_\_\_  
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- Lifejackets—watchstanders and crew (spot-check)
  - Condition SOLAS 74/78 III/19.2
  - Stowage SOLAS 74/78 III/7.2.2
  - Retro-reflective material SOLAS 74/78 III/30.2.7
  - Lights SOLAS 74/78 III/27.2
  - Whistles SOLAS 74/78 III/32.1.6
- Line-throwing appliances (spot-check) SOLAS 74/78 III/17
  - 4 charges
- Pyrotechnics (spot-check) SOLAS 74/78 III/6.3
  - 12 red rocket flares
- Immersion suits and thermal protective aids (spot-check) SOLAS 74/78 III/27.3
  - Condition SOLAS 74/78 III/19.2
  - Retro-reflective material SOLAS 74/78 III/30.2.7

**Fire Protection:**

- Fire control plan SOLAS 74/78 II-2/20
  - Permanently exhibited
  - Language of flag state
  - Copy permanently stored in weathertight container outside deckhouse
- Fire doors (spot-check) SOLAS 74/78 II-2/46  
SOLAS 74/78 II-2/47
  - Machinery space and stair towers
  - Not tied or blocked open
  - Installed closure devices working
- Fire detection systems (spot-check)
  - Smoke / fire alarms SOLAS 74/78 II-2/13
  - Remote pull stations SOLAS 74/78 II-2/11.8
  - Smoke / flame / heat detectors and sensors SOLAS 74/78 II-2/53

Notes: \_\_\_\_\_

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- International shore connection SOLAS 74/78 II-2/19
- Means of escape from accommodation, machinery, and other spaces SOLAS 74/78 II-2/45
  - Two required (some exceptions)
  - Dead end corridors
- Portable fire extinguishers (spot-check)
  - Good condition / available for immediate use SOLAS 74/78 II-2/21
  - Located on stations
  - Serviced at periodic intervals SOLAS 74/78 II-2/6.5
- ◇ Test operation of fire main system
  - Required number of fire pumps SOLAS 74/78 II-2/3
  - Location of pumps SOLAS 74/78 II-2/4
  - Pumps, hydrants, piping, hoses, and nozzles in good condition and available for immediate use SOLAS 74/78 II-2/21
- ◇ Structural fire protection (spot-check) SOLAS 74/78 II-2/42
  - Bulkheads
  - Insulation
  - Ventilation
  - Penetrations
- ◇ Fixed fire extinguishing systems: cargo, machinery, and other spaces SOLAS 74/78 II-2/21
  - Tanks, cylinders, piping, controls, alarms, and release mechanisms in good condition and available for immediate use

<b>Type of system:</b> (circle appropriate type)			
Low Pressure CO <sub>2</sub>	High Pressure CO <sub>2</sub>	Halon	Foam

**Pollution Prevention:** (spot-check at reexaminations)

- Pollution placard posted 33 CFR 155.450
- MARPOL V placard posted 33 CFR 151.59  
MARPOL Ax. V/9

Notes: \_\_\_\_\_

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- Oil and hazmat
  - Fuel oil and bulk lubricating oil discharge containment 33 CFR 155.320
  - Prohibited oil spaces 33 CFR 155.470
- Oily-water separating equipment, bilge alarm, and bilge monitor
  - MARPOL Ax. I/16  
33 CFR 155.380
  - Alarm, recorder
  - Standard Discharge Connection 33 CFR 155.430
- Garbage
  - Shipboard garbage properly disposed MARPOL Ax. V/3  
33 CFR 151.63
  - Incinerator
    - Evidence of use (clinkers)
    - Safety of burner assembly
    - Electrical controls
  - Garbage Management Plan MARPOL Ax. V/9
- Marine sanitation device
  - Type (I, II, or III) 33 CFR 159.7
  - Nameplate 33 CFR 159.55
  - Placard 33 CFR 159.59

**Machinery Spaces:**

- Main and auxiliary machinery installations
  - General housekeeping SOLAS 74/78 I/11(a)
  - Fire hazards
  - Shock and electrical hazards SOLAS 74/78 II-1/45.1
  - Personnel hazards (moving parts not protected, hot surfaces, etc.) SOLAS 74/78 II-1/26
    - Leaking fuel oil piping or fittings
    - Sea chests, sea valves / spool pieces in good condition
  - Tank tops and bilges free of oil SOLAS 74/78 II-2/15
  - Watertight doors SOLAS 74/78 II-1/23
    - Hand / power operation
    - Local / remote control
    - Alarm

Notes: \_\_\_\_\_  
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- Steering gear machinery SOLAS 74/78 II-1/29
  - Linkages
  - Hydraulic leaks
  - Ram guides
  - Lubrication
  
- ◇ Operationally test main and auxiliary steering gear SOLAS 74/78 II-1/29.15 through 29.20
  - 28-second operation
  - Systems operate independently
  - Unusual vibrations / leaks
  - Ram hunting
  - Limit switches
  - Communications with bridge
  - Steering gear instructions (block diagram)
  
- ◇ Main ship service generators SOLAS 74/78 II-1/41  
**NOTE:** *Two independent sources of power require.*
  - F/O piping
  - Cooling lines
  - Controls
  
- ◇ Emergency generator room SOLAS 74/78 II-1/43
  - Test operation of prime mover
  - Personnel safety
  - Ventilation adequate
  - Electrical switchboard
    - Grounds
  
- ◇ Bilge pumps SOLAS 74/78 II-1/21
  - Two required

Notes: \_\_\_\_\_

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## Section 4: Cargo Operations for Chemical / Gas Carriers

### Bulk Liquid, Liquefied Gas, or Compressed Gas Hazardous Materials:

*NOTE: If vessel carries cargo listed in 46 CFR Part 154, use the requirements under "Bulk Liquefied Gases" at the end of this section.*

- Containment
  - Type
    - I 46 CFR 153.230
    - II 46 CFR 153.231
    - III 46 CFR 153.232
  - Separation of cargo tanks / other spaces 46 CFR 153.233
  - Piping location restriction exemptions 46 CFR 153.235
  - Materials
    - Prohibited 46 CFR 153.236
    - Required 46 CFR 153.238
    - Cast iron 46 CFR 153.239
  
- Tanks
  - Double bottom or deep tanks 46 CFR 153.250
  - Independent tanks 46 CFR 153.251
  - Access 46 CFR 153.252
  - Trunks, domes, and openings 46 CFR 153.254
  - Linings 46 CFR 153.256
  
- Piping
  - Design 46 CFR 153.280
  - Independent tanks 46 CFR 153.281
  - Filling lines 46 CFR 153.282
  - Separation 46 CFR 153.292
  - Marking 46 CFR 153.294

Notes: \_\_\_\_\_  
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Valves and handling equipment

- Manual stop 46 CFR 153.283
- Pump manifolds 46 CFR 153.285
- Emergency shutdown stations tested 46 CFR 153.296
  - Minimum of two
  - Location
  - Single actuator
  - Properly marked
- Actuator at cargo control 46 CFR 153.297

Cargo handling space ventilation

- Forced exhaust ventilation 46 CFR 153.310
- System standards 46 CFR 153.312
  - Discharge 10 meters from accommodation / service spaces
  - Operable from outside space
  - Air exchange rate 30 times per hour
  - Exhaust above and below deck places
- Special ventilation rate 46 CFR 153.316
  - Rate for certain cargoes (45 times per hour and no less than 4 meters above deck)

Pumprooms

**NOTE:** *If pumproom is not gas-free, issue requirement to make it available at next U.S. port.*

MSM Vol. I Ch.10  
Appendix A  
MSM Vol. II Ch. A5.H

- Marine Chemist Certificate 46 CFR 153.330
  - Chemist No. \_\_\_\_\_
  - Certificate No. \_\_\_\_\_
  - Date issued \_\_\_\_\_
- Ventilation SOLAS 74/78 II-2/59.3
- Hoisting arrangement 46 CFR 153.332
- Pump discharge pressure gauge 46 CFR 153.333
- Bilge pumping system 46 CFR 153.334
  - Witness operation and alarm
- Fire extinguishing system SOLAS 74/78 II-2/63
- Electrical installation
- Special requirements 46 CFR 153.336

Notes: \_\_\_\_\_

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- ☐ Tank venting
  - Safety relief valves only
  - Type
    - B/3 vents 46 CFR 153.350
    - 4m vent 46 CFR 153.351
    - High-velocity vents 46 CFR 153.353
  - B/3 and 4m outlets 46 CFR 153.352
    - Vertical discharge
    - Prevent precipitation from entering
  - No restrictions 46 CFR 153.360
  - System drains 46 CFR 153.362
  - Pressure vacuum valves 46 CFR 153.355
    - Location
    - Requirements 46 CFR 153.368
    - Set pressures > .5 psi
    - Date last tested \_\_\_\_\_
  - Liquid overpressurization 46 CFR 153.365
    - Control system meets 46 CFR 154.408
      - Yes
      - No
    - Spill valve meets ASTM F-1271
      - Yes
      - No
  - Special requirements 46 CFR 153.372
- ☐ External examination of inert gas system 46 CFR 32.53  
MSM Vol. II Ch. C5
  - Piping and components
  - Scrubber
  - Fans
  - Valves
  - Expansion joints
  - Free of corrosion or leakage

Notes: \_\_\_\_\_  
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- Gauging system
  - Type 46 CFR 153.400
    - Open
    - Closed 46 CFR 153.404
      - Vapor return connection
      - High level alarm
      - Means for sampling
    - Restricted 46 CFR 153.406
      - Vapor-tight cover
      - Lock open P/V valves or valved bypasses
      - Sounding tube requirements 46 CFR 153.407
- Tank overflow control 46 CFR 153.408
  - High level alarm 46 CFR 153.409
    - Set point (< 97%) \_\_\_\_\_%
    - Witnessed operation test
    - Visual / audible alarms at cargo control and open deck
    - Marked “High Level Alarm”
  - Cargo overflow alarm 46 CFR 153.408
    - Independent of high level alarm
    - Operates on loss of power
    - Set point (< 100%)
    - Witnessed test at tank
    - Visual / audible alarms in containment area and cargo loading control
    - Marked “Tank Overflow Alarm”
  - Automatic shutdown system 46 CFR 153.408
    - Independent of high level alarm
    - Operates on loss of power
    - Set point (< 100%) \_\_\_\_\_%
    - Witnessed test at tank

Notes: \_\_\_\_\_  
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- ☐ Temperature control systems 46 CFR 153.430
  - Standby cooling system 46 CFR 153.432
  - Refrigerated cargo tanks 46 CFR 153.438
    - Alarms
    - Pressure
    - Temperature
    - Witness operation
  - Fluid compatibility with cargo 46 CFR 153.436
  - Remote temperature sensors 46 CFR 153.440
  
- ☐ Flammable or combustible cargoes
  - Weatherdeck fire protection system 46 CFR 153.460
  - Electrical bonding of independent tanks 46 CFR 153.461
  - Vent discharge 10 meters from ignition source 46 CFR 153.463
  - Vapor detector 46 CFR 153.465
    - 1 fixed
    - 1 portable
    - Witnessed calibration
  
- ☐ Emergency equipment
  - Personnel emergency and safety equipment 46 CFR 153.214
    - Two stretchers or wire baskets
    - Self-contained breathing apparatus (SCBA) with 5 refill tanks; date professionally serviced \_\_\_\_\_ BCH/3.16.8 & IBC/14.2.6
    - Overalls
    - Boots
    - Long-sleeve gloves
    - Goggles
    - Steel-cored lifeline with harness
    - Explosion-proof lamp
    - First aid equipment
    - Inspected every 30 days BCH/3.16.8 & IBC/14.2.6
  - Safety equipment lockers 46 CFR 153.215
    - Minimum of two
    - Accessible
    - Markings
  - Shower and eyewash fountains 46 CFR 153.216

Notes: \_\_\_\_\_

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- Toxic vapor detectors 46 CFR 153.526
  - Vapor detector
    - 1 fixed
    - 1 portable
    - Witness calibration
  
- General safety
  - Entry into spaces 46 CFR 153.934
  - Opening of tanks 46 CFR 153.935
  - Storage of cargo samples 46 CFR 153.935(a)
  
- Vapor Control System (VCS) 46 CFR 156.120(aa)  
46 CFR 39.10-13(d)
  - Vessel in not using a VCS
  - Vessel is using a VCS
    - LOC endorsed for VCS use
    - Complies with 33 CFR 156.120(aa) and 156.170(g)
  
- Cargo transfer procedures
  - Signals 46 CFR 153.953
    - Red flag
    - Red light
  - Warning signs 46 CFR 153.955
    - Minimum of two
    - Legends
      - “Warning”
      - “Dangerous Cargo”
      - “No Visitors”
      - “No Smoking”
      - “No Open Lights”
    - Lettering 46 CFR 153.957
  - Person-in-charge
    - Valid document 33 CFR 155.700
    - Designated by master 33 CFR 155.710
    - Speaks English or has interpreter 46 CFR 153.959
  - Approval to begin transfer 46 CFR 153.972
  - Cargo hose
    - Marked in accordance with 46 CFR 153.940
    - Working pressure
    - Date of last pressure test \_\_\_\_\_ < 1 year
    - Temperature range \_\_\_\_\_

Notes: \_\_\_\_\_

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## **Bulk Liquefied Gases:**

**NOTE:** Vessels carrying bulk liquefied gases must meet the requirements of 46 CFR Part 154.

- Cargo piping 46 CFR 154.310
  - Connections
- Pump and compressor rooms 46 CFR 154.315
  - If prime mover is in adjacent space
    - Bulkhead / deck is gas tight
    - Positive pressure seal(s)
- Control stations 46 CFR 154.320
  - Above weather deck
  - Gas-safe
  - Instrumentation
- Openings 46 CFR 154.330
  - Distance from athwartships bulkhead > 10 feet
  - Fixed port lights
  - Gaskets on wheelhouse doors and windows
  - Air intakes
- Air locks 46 CFR 154.345
  - Two steel, self-closing doors, with no hold-open devices
  - Audible / and visual alarms
  - Mechanically ventilated from a gas-safe place
  - Air pressure in air lock is > gas-dangerous space, but < gas-safe space
  - Vapor leak monitor
  - Automatic power cut-off in gas-safe space
  - Witnessed operational tests
- Liquid pressure relief 46 CFR 154.517
  - Date last tested and certified \_\_\_\_\_
  - Piping relief valves discharge 46 CFR 154.519
    - Cargo tank
    - Vent mast
    - Suction (if on cargo pump)

Notes: \_\_\_\_\_

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- Maximum allowable relief valve setting for cargo tanks  $\leq 10$  psig (69 kPa)
  - Liquid and vapor connections 46 CFR 154.530
  - Shutoff valves located as close to tank as possible
    - Capable of local manual operation
    - At least one remotely controlled quick-closing shutoff valve
  - Quick-closing valve emergency shutdown 46 CFR 154.540
    - Closes all valves
    - Two remote locations
    - Fusible elements
    - Automatic shutdown of cargo pumps and compressors 46 CFR 154.534
  - Quick-closing valve requirements 46 CFR 154.544
    - Fail close
    - Local manual closing
    - Witness test (< 30 seconds)
    - Time to close \_\_\_\_\_

- Maximum allowable relief valve setting for cargo tanks  $> 10$  psig (69 kPa)
  - Shutoff valves located as close to tank as possible 46 CFR 154.532
    - Capable of local manual operation
    - At least one remotely controlled quick-closing shutoff valve
    - Witness test (< 30 seconds)
    - Time to close \_\_\_\_\_
  - If piping is less than 2 inches (50 mm) 46 CFR 154.532(b)
    - Excess flow valve
    - Closes automatically 46 CFR 154.546
  - OR
  - One valve that is capable of local manual operations and meets 46 CFR 154.540 and 154.544

- Cargo hose 46 CFR 154.556
  - Marking
  - Hydrostatic test date \_\_\_\_\_ 46 CFR 154.562

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☐ Cargo vent systems

- Pressure relief systems 46 CFR 154.801
  - Tank volume  $\leq$  20 cubic meters and has at least one pressure relief valve
  - Tank volume  $>$  20 cubic meters and had at least two pressure relief valves of same capacity
  - Tank MARVS \_\_\_\_\_
  - Relief valve setting(s) less than tank MARVS
  - Date last tested \_\_\_\_\_
  - Properly sealed
  - No stop valves unless interlocked
- Vacuum protection (method for testing either of the following) 46 CFR 154.804
  - 2 independent pressure switches
    - 1 to operate audible and visual alarms set at 80% in cargo control room and in wheelhouse
    - 1 to automatically shut off liquid or vapor suction
  - Vacuum relief valve
    - Adequate gas flow capacity
    - Set to open
    - Admits inert gas, vapor, or air
- Vent masts 46 CFR 154.805
  - Discharge vertically upward
  - Proper weather hood
  - Proper screen (last serviced / replaced \_\_\_\_\_)
  - Height above weather deck \_\_\_\_\_  
( $>$  B/3 or 6 meters / 19.7 feet)
  - Height above working level \_\_\_\_\_  
(6 meters / 19.7 feet)
    - Adequate distance from air takes to accommodation and other gas-free spaces  $>$  10 meters

Notes: \_\_\_\_\_

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Atmospheric control (hold and interbarrier spaces) 46 CFR 154.902

Vessel carries flammable cargoes with full secondary barriers

- Inert gas system
  - At least one check valve in cargo area to prevent backflow
  - Inert gas has < 5% oxygen
  - Audible and visual alarm set at 5%
  - Inerted spaces fitted with proper relief devices
- Stored gas
  - Must meet 46 CFR 154.1848

Vessel carries flammable cargoes with partial secondary barriers

- Meets requirements of full secondary barriers with the capacity to inert largest hold and interbarrier space, AND either
    - Meets 46 CFR 154.1848 OR
    - Has air drying system
- 46 CFR 154.902(c)(2)

Vessel carries nonflammable cargoes with secondary barriers

- Meets requirements of full secondary barriers OR
  - Has air drying system
- 46 CFR 154.902(c)(2)

Electrical (gas-dangerous space or zone) 46 CFR 154.1010

- Intrinsically safe
- Only specific explosion-proof equipment in cargo handling rooms, cargo hose storage rooms, spaces with cargo piping, and gas-dangerous zones on the weather deck
- Only through runs of cable in cargo hose storage rooms, spaces with cargo piping, and gas-dangerous zones on the weather deck

Notes: \_\_\_\_\_  
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☐ Firefighting

- Exterior water spray 46 CFR 154.1105
  - Areas protected 46 CFR 154.1110
  - Discharge 46 CFR 154.1115
  - Nozzles 46 CFR 154.1120
  - Pipes, fittings, and valves 46 CFR 154.1125
  - Pumps 46 CFR 154.1135
    - Witnessed simultaneous operation of deck spray and firemain systems
- Dry chemical 46 CFR 154.1145
  - Cargo capacity < 1,000 cubic meters (35,300 cubic feet)—at least 1 self-contained unit
  - Cargo capacity ≥ 1,000 cubic meters (35,300 cubic feet)—at least 2 self-contained units
    - Date last serviced \_\_\_\_\_
  - Distribution 46 CFR 154.1150
    - Cargo areas and pipelines
      - At least 2 hand hose lines OR
      - At least 1 hand hose line and 1 monitor
    - After end of cargo areas
      - At least 1 storage unit AND
      - Hand hose line or monitor
    - Each cargo manifold
      - At least 1 monitor
  - Controls 46 CFR 154.1165
    - Local for hand hose line and monitor
    - Remote for cargo manifold monitor

☐ Cargo area mechanical ventilation 46 CFR 154.1200

- Fixed exhaust systems where required
  - Exhaust system ducts where required 46 CFR 154.1205
  - Location of exhaust ducts
- Fixed supply systems where required
- Operational controls outside the ventilated space
- Electric ventilation motor location
- Ventilation impeller and housing materials
- Protective metal screen

Notes: \_\_\_\_\_

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- ☐ Liquid level gauging
  - Open 46 CFR 154.1305
  - Restricted
  - Closed
    - Date last calibrated and tested \_\_\_\_\_
    - Maximum operating pressure \_\_\_\_\_
  - Closed gauge shutoff valve 46 CFR 154.1310
  - Restricted gauge excess flow valve 46 CFR 154.1315
  - High liquid level alarm system 46 CFR 154.1325
    - Independent of gauging system
    - Set below 100% liquid full
    - Activates audible and visual alarms upon activation of quick-closing valves
    - Witness operational tests

- ☐ P/V protection 46 CFR 154.1335
  - At least 1 high pressure sensor
    - Actuates below tank MARVS
    - Actuates audible and visual alarms at cargo control station and remote group alarm in wheelhouse
    - Witness operational test
  - At least 1 low pressure sensor
    - Actuates audible and visual alarms at cargo control station and remote group alarm in wheelhouse
    - Witness operational test
  - Manifold pressure gauge fitted where required

- ☐ Temperature measuring devices 46 CFR 154.1340
  - Bottom and maximum liquid level locations
  - Cargo control station readouts
    - Audible and visual alarms in cargo control room and wheelhouse
    - Witness operational test

Notes: \_\_\_\_\_  
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☐ Gas detection systems

- Gas detection for “I” OR “I” and “T” cargoes
  - Fixed flammable gas detection system
    - Sampling points where required
    - Measures gas concentrations at least 0% to 200% of alarm concentrations
    - Date last calibrated \_\_\_\_\_
    - Span gas used \_\_\_\_\_
    - Concentration \_\_\_\_\_
    - Audible and visual alarms that are actuated—
      - At 30% or less LEL
      - For power failure
      - For loss of gas sampling flow
    - Sampling points monitored every 30 minutes or less
    - Operable flow meter
    - Witness operation and operational tests
  - 2 portable detectors that each measure 0% to 100% LEL
- Gas detection for “T” OR “I” and “T” cargoes
  - 2 portable detectors that each show TLV
  - Fixed sampling tubes in each hold and interbarrier space
- Oxygen analyzer

46 CFR 154.1345  
46 CFR 154.1350

46 CFR 154.1365

46 CFR 154.1360

Notes: \_\_\_\_\_  
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- Safety equipment 46 CFR 154.1400
  - Required safety equipment based on cargo capacity (see the following table)
    - Vessel's cargo capacity is < 25,000 cubic meters 46 CFR 154.1400(a)
    - Vessel's cargo capacity is ≥ 25,000 cubic meters 46 CFR 154.1400(b)
  - Respiratory equipment 46 CFR 154.1405
    - Additional required equipment on board
  - Decontamination shower 46 CFR 154.1410
    - Shower and eye wash on weatherdeck
    - Properly marked
  - Equipment locker 46 CFR 154.1430
    - Required equipment stowed

Equipment	Amount Required for Specific Cargo Capacities		
	< 25,000 cubic meters	≥ 25,000 cubic meters	Table 4 (special requirements)
30-minute SCBA	6	8	3
SCBA spare bottles	9	9	9
Steel-cored lifeline	6	8	3
Explosion-proof flashlight	6	8	3
Fire axes	3	3	0
Helmets	6	8	3
Boots and gloves	6	8	3
Goggles	6	8	3
Heat-resistant outfits	3	5	0
Chemical-protective outfits	3	3	3

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## Section 5: Cargo Operations for Natural Gas (LNG) Carriers

### Vapor Control Systems:

- Person-in-charge of transfer system completed training program 46 CFR 39.10-11
  
- VCS certification 46 CFR 39.10-13
  - Marine Safety Center Letter No. \_\_\_\_\_  
OR
  - Approval from recognized class society addressing the following items:
    - Vessel name
    - Class of vessel or official number
    - Call sign
    - Flag
    - Reviewed by proper authority to meet U.S. standard 46 CFR Part 39
    - Inert gas manual amended 46 CFR 32.53-85(b)
    - Proper allowable transfer rate (cubic meters / hour)
    - Applicable cargo tanks
    - Maximum density of cargo vapor
    - List of cargoes (proper cargo names)
    - Oil transfer procedures amended 33 CFR 155.750(d)

### VCS Design and Equipment:

*NOTE: Requirements for VCS design and equipment are detailed in 46 CFR 39.20-1.*

- Piping permanently installed
  - Interim for chemical tankers
- Connection located at manifold
  - N/A if chemical tankship venting system is not common
- Incompatible cargo vapors can be isolated
- Connections located at cargo tanks

Notes: \_\_\_\_\_

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- Drains fitted in low points of system
- Piping electronically bonded to hull and electrically continuous
- VCS able to be isolated from IGS with isolation valve
- Cargo tank venting able to be isolated from VCS
- Manual isolation valve at each vessel vapor connection
  - Position of isolation valve verified by:
    - Markings
    - OR
    - Position of stem
- Last meter of piping before connection
  - Painted red / yellow / red
  - Labeled "vapor"
- Vapor connections
  - Stud 0.5 X 1.0 inches at 12 o'clock position on the flange in line with bolt pattern
- Vapor hoses
  - Annually hydrostatically tested to 1.5 X MAWP (also vapor collection arm)
  - Design burst pressure of 25 psig
  - MAWP of 5 psig
  - Capable of withstanding 2 psig vacuum without collapsing or constriction
  - Electrically continuous with a maximum resistance of 10,000 ohms
  - Resistant to abrasion and kinking
  - Last meter of painted red / yellow / red and labeled "vapor"
- Saddles available for support of VCS hoses

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**Cargo Gauging System:**

- Closed gauging system 46 CFR 39.20-3
  - Independent of overfill alarm system
  - Full range of measurement in each cargo tank
  - Liquid level indicated where cargo transfer is controlled 46 CFR 151.15-10
  - Unit installed on cargo tanks during entire transfer if closed gauging system is portable

**Liquid Overfill Protection:**

*NOTE: Requirements for liquid overfill protection are detailed in 46 CFR 39.20-7.*

- Overfill system
  - Provides an alarm upon loss of power or electrical circuitry failure
    - Audible and visual alarm on deck and where cargo transfer is controlled
    - Capable of being tested at the tank or have a electronic self-testing feature
  - Properly marked on deck
  - Operationally tested and demonstrated

- High-level alarm
  - Independent of overfill system
  - Provides an alarm upon loss of power or electrical circuitry failure
    - Audible and visual alarm on deck and where cargo transfer is controlled
    - Capable of being tested at the tank or have a electronic self-testing feature
  - Alarm sounds not higher than overfill alarm and at no lower than 95% of tank capacity
  - Operationally tested and demonstrated

- Spill valves 46 CFR 39.20-9(c)

- Rupture disks 46 CFR 39.20-9(d)

Notes: \_\_\_\_\_

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## **Vapor Overpressure and Vacuum Protection:**

*NOTE: Requirements for vapor overpressure and vacuum protection are detailed in 46 CFR 39.20-11.*

- VCS system designed to discharge cargo vapor at 1.25 times the maximum transfer rate
- Design pressure verified
  - Spill valves, rupture disks, working vapor pressure set below maximum design pressure of VCS
- Maximum design vacuum pressure verified
- P/V valves settings verified
  - Pressure and vacuum annually pressure tested
  - Do not relieve at a pressure < 1.0 psig
  - Do not relieve at a vacuum < -0.5 psig
  - All P/V valves meet regulations or API 2000 standard 46 CFR 162.017
  - A means to check the seating of the P/V valve if installed after 23 JUL 91

## **High and Low Vapor Pressure Protection:**

*NOTE: Requirements for high and low vapor protection are detailed in 46 CFR 39.20-13.*

- Pressure sensing devices located in main vapor collection line
  - Tested to show accurate within 10% of the actual pressure
- Pressure indicator located at the cargo control station
- High pressure alarm
  - Audible and visual alarms where cargo transfer is controlled
  - Activates no higher than 90% of the highest P/V valve vacuum setting

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- Low pressure alarm
  - Audible and visual alarms where cargo transfer is controlled
  - Activates no less than 0.144 for an inerted tankship or no less than the lowest P/V valve vacuum setting

**Operations:**

*NOTE: Requirements for operations are detailed in 46 CFR 39.30-1.*

- Pressure drops
  - Determined through VCS from most remote cargo tank to the connection
  - Determined for all cargoes at maximum transfer rates and at lesser transfer rates
  - Determined through vapor hoses, if carried
- Cargo tanks properly filled
  - Less than 98.5% of tank capacity  
OR
  - Less than overfill setting
- High-level and overfill alarms been tested within 24 hours prior to loading cargo
- Operationally test and demonstrate remote operated valves
- Operationally test and demonstrate emergency shutdowns

Notes: \_\_\_\_\_  
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- Oil transfer procedures properly amended 33 CFR 155.750(a)
  - Line diagram of VCS piping
    - Valves
    - Control devices
    - P/V valves
    - Pressure indicators
    - Flame arrestors (if fitted)
    - Detonation arrestors (if fitted)
    - Spill valves (if fitted)
    - Rupture disks (if fitted)
  - Maximum allowable transfer rate \_\_\_\_\_
  - Initial transfer rates for each tank \_\_\_\_\_
  - Tables or graphs and VCS pressure drops
  - Relief settings
    - Spill valves \_\_\_\_\_
    - Rupture disks \_\_\_\_\_
    - P/V valves \_\_\_\_\_
  - Description of and procedures for operating VCS
    - Pre-transfer equipment inspection requirements
    - Vapor line connection
    - Closed gauging system
    - High-level alarm system
    - Independent automatic shutdown system (if fitted)

**Cargo Boil-off Used As Fuel:**

- General 46 CFR 154.705
  - Inert gas connection
  - Fuel flow maintained when gas supply is cut off 46 CFR 154.1854

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- ☐ Fuel lines 46 CFR 154.706
  - Master valve
    - Double-walled fuel line
      - Annular space inerted
      - Pressure in annular space greater than gas pressure
      - Visual and audible alarms in machinery space to indicate loss of inert gas pressure
      - Termination 46 CFR 154.707(a)
    - Single-walled fuel line
      - Installed in mechanically exhaust-ventilated duct or pipe
      - Ventilation (30 changes of air / hour) 46 CFR 154.1205
      - Pressure in space between inner and outer pipe < atmospheric pressure
      - Continuous gas detection
      - Termination hood or casing 46 CFR 154.707(a)
  
- ☐ Valves 46 CFR 154.708
  - 2 fail-closed valves
  - 1 fail-open valve for venting
  - Automatic operation for—
    - Loss of boiler forced draft
    - Flame failure
    - Abnormal fuel supply pressure
  - Master gas fuel valve outside machinery space
    - Operable from machinery space and at valve
    - Automatic closure for—
      - Gas leak
      - Loss of ventilation
      - Loss of inert gas pressure
  
- ☐ Gas detection equipment 46 CFR 154.709  
46 CFR 154.1350
  - Audible and visual alarm in machinery control station and wheelhouse
  - Closes master gas fuel valve

Notes: \_\_\_\_\_  
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## Section 7: Expanded Examination Items

### Manuals and Instructions:

- Check for presence of the following documents
  - Instructions for maintenance and operation of all installations / equipment for fighting and containing a fire SOLAS 74/78 II-2/20
  - Training manual for lifesaving appliances SOLAS 74/78 III/18.2
  - Instructions for onboard maintenance of lifesaving appliances SOLAS 74/78 III/51  
SOLAS 74/78 III/19.3  
SOLAS 74/78 III/52
  - Stability booklet, associated stability plans and information SOLAS 74/78 II-1/22  
ICLL 66 Reg. 10
- Cargo gear certificate
- Human Factors STCW Code
  - Determine if the appropriate crew members are able to understand the information given in manuals, instructions, etc., relevant to the safe condition of the ship and its equipment, and that they are aware of the requirements for maintenance, periodical testing, training, drills, and recording of logbook entries.

### Safety Management System (SMS):

*NOTE: Requirements and guidance for inspecting vessel Safety Management Systems are detailed in SOLAS 74/78, Chapter IX and NVIC 4-98.*

- Documentation (may be in the form of a Safety Management Manual)
  - Controlled documents
  - Quality policy
  - Master of vessel familiar with SMS
  - Language understood by crew
  - Documentation identifies:
    - Written procedures kept on board vessel
    - Essential or critical equipment identified (or a separate manual containing this information)
    - Procedures for reporting non-conformities
    - Company's designated person(s) (name or title, and address)

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○ Company's training program conducted in accordance with STCW STCW I/14

**NOTE:** Documented procedures established to ensure new personnel and personnel transferred to new assignments are given proper familiarization with their duties.

- Proper documentation
- Training conducted before crew is assigned shipboard duties
- Essential instructions are documented and provided before sailing

○ Crew familiar with SMS issues

- Ship's officers
  - Documented procedures
  - Preventative procedures for essential equipment
  - Reporting requirements for non-conformities and able to identify typical scenarios that may result in a documented non-conformity
- Master and chief engineer familiar with internal audit procedures (e.g., know how many audits required per year and have participated in at least one) in addition to requirement's for ship's officers

○ Documented maintenance system

- Documented in writing and computerized versions
- Readily available and in language understood by those who use them
- Procedures are followed
- Records maintained

○ Vessel-specific procedures are documented in writing and address the following areas:

**NOTE:** Not mandatory that they follow the exact format listed below.

- Preventative maintenance
- Navigation
- Bunkering operations
- Emergency preparedness
- Pollution prevention
- Technical procedures
- Communications

Notes: \_\_\_\_\_  
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- Audits
  - Internal audits conducted as specified by SMS  
*NOTE: Do NOT examine internal audit records.*
  - External audit results reviewed
    - Status of open non-conformities relevant to deficiencies leading to detention
    - Status of implementation of corrective and preventative measure
- SMS review conducted by Master in accordance with procedures in SMS
  - Non-conformities identified
  - Report of non-conformity prepared and sent in accordance with procedures established by SMS

**Navigation Safety:**

- Test navigation equipment listed in Section 3 to the extent necessary to determine if equipment is operating properly.
  - Human Factors (spot-check): determine if deck officers are familiar with the following items:
    - Operation of bridge control and navigational equipment
    - Use of nautical publications and charts
    - Ship maneuvering characteristics
    - Lifesaving signals
    - Bridge procedures, instructions, manuals, etc.
    - Changing steering from automatic to manual and vice versa
    - Preparations for arrival and departure
    - Communications with engine room
    - Use of VHF
    - Raising the alarm
    - Abandon ship drill and fire drill
- STCW Table A-II  
NVIC 3-98

Notes: \_\_\_\_\_

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- Lights, shapes, and sound signals 72 COLREGS
  - Navigation lights
  - Sound signals
  - Distress signals
- Radio log SOLAS 74/78 IV/17
- Radio operation SOLAS 74/78 IV/7
  - Transmit on 2182 MHz and Ch. 6, 13, 16, 70
- INMARSAT communications SOLAS 74/78 IV/7.1.5

**Cargo Operations:**

- Human Factors: determine if personnel are familiar with the following items: STCW Table A-II/III
  - Special requirements (e.g., loading, segregation, firefighting equipment, etc.) for particular cargoes
  - Dangers posed by the cargo
  - Measures to be taken for cargo emergencies

**Lifesaving Equipment:**

- Lifeboats/liferafts/rescue boats
  - Ensure effective operation of winches, davits, falls, sheaves, etc. (Lower at least one lifeboat to the water.) SOLAS 74/78 III/19
  - Test lifeboat and rescue boat flemming gear and/or engines
  - Verify presence/condition of lifeboat equipment SOLAS 74/78 III/41
  - Retro-reflective tape
  - Lighting SOLAS 74/78 III/11.4

Notes: \_\_\_\_\_  
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- Emergency communication equipment
  - 2-way VHF radiotelephone apparatus SOLAS 74/78 III/6.2
  - Radar transponders
  - Survival craft EPIRBs
  - Onboard communication and alarm system SOLAS 74/78 III/6.4
- Line-throwing appliance SOLAS 74/78 III/17.49
  - Specifications and equipment
- Pilot ladders and hoists in good condition SOLAS 74/78 V/17
- Distress signals SOLAS 74/78 III/6.3
  - 12 red rocket parachute flares

**Fire Protection:**

- Structural fire protection SOLAS 74/78 II-2/42, 43, 44, 46, 47, 49, & 50
  - Bulkheads and decks meet applicable fire integrity requirements
  - Openings (e.g., doors, ductwork, electrical wires, piping, etc.) constructed so that they do not destroy fire resistance of bulkheads
  - Manual and automatic fire doors examined / tested
- Fire detection, fire alarm, and automatic sprinkler systems fitted where required and operating properly SOLAS 74/78 II-2/52
- Ventilation systems SOLAS 74/78 II-2/48
  - Main inlets and outlets of all ventilation spaces can be closed from outside ventilated space
  - Power ventilation capable of being shutdown from outside ventilated space
- Fire pumps SOLAS 74/78 II-2/4
  - Fire main activated; water pressure satisfactory (energize forward-most and highest hydrants)

Notes: \_\_\_\_\_

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- Paint lockers and flammable liquid lockers protected by an appropriate fire extinguishing arrangement SOLAS 74/78 II-2/18.7
- Fixed fire extinguishing arrangements in cargo spaces for vessels ≥ 2000 GT SOLAS 74/78 II-2/53.1
- Special arrangements in machinery spaces SOLAS 74/78 II-2/11
  - Machinery space ventilating fans can be shut down from outside spaces
  - All openings capable of being closed from outside machinery spaces
  - Machinery driving forced / induced draft fans, oil fuel transfer pumps, and other fuel pumps fitted with remote shutdowns located outside space concerned
- Firemen's outfits (spot-check) SOLAS 74/78 II-2/17.3
  - Two lockers
  - Four outfits
  - Protective clothing
  - Helmet, boots, and gloves
  - Lamp
  - Axe
  - Breathing apparatus and lifeline

**Pollution Prevention:**

- Equipment
  - Test automatic stopping device required for discharge MARPOL Ax. I/10
  - Segregation of oil fuel and water ballast systems MARPOL Ax. I/14
  - Oily residue tank (discharge arrangements, homogenizers, incinerators, etc.) MARPOL Ax. I/17  
33 CFR 155.780
  - Witness operational test of emergency shutdown

Notes: \_\_\_\_\_  
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 \_\_\_\_\_

- Human Factors
  - Oil and oily mixtures
    - Responsible officer familiar with handling of sludge and bilge water
    - Quantity of residues generated
    - Capacity of holding tanks
    - Capacity of oil water separator
    - Note any inadequacies in reception facilities used; advise master to report these to flag state
  - Garbage
    - Note any inadequacies in reception facilities used; advise master to report these to flag state
    - Crew familiar with Annex V requirements

STCW Table A-III

MARPOL Ax. I

MARPOL Ax. V

**Machinery Spaces:**

- Test communication between navigating bridge and machinery space
  - Two means, one of which must be an engine order telegraph
- Emergency source of electrical power
  - Location
  - Generator and/or batteries tested under load
  - Emergency lighting
- Main engine / vital auxiliaries (spot-check)
  - F/O pumps / piping
  - S/W pumps / piping
  - J/W pumps / piping
  - L/O pumps / piping
  - Piston cooling pumps / piping
  - Air compressors / receivers
  - Fuel / oil purifiers
  - H/O heaters / transfer pump

SOLAS 74/78 II-1/37

SOLAS 74/78 II-1/43  
SOLAS 74/78 II-1/44

SOLAS 74/78 II-1/27

Notes: \_\_\_\_\_  
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- Steering gear alarms SOLAS 74/78 II-1/29
  - Low hydraulic oil
  - Loss of power
  - Loss of phase
  - Overload

- Human Factors: determine if personnel are familiar with the operation of the following items STCW Table A-III

- Emergency generator:
  - Actions necessary before engine can be started
  - Different methods by which generator may be started
- Stand-by generator engine:
  - Methods to start engine automatically or manually
  - Blackout procedures
  - Load-sharing system
- Steering gear:
  - Action needed to bring main and auxiliary into operation
  - Changing steering from automatic to manual and vice versa
- Bilge pumps:
  - Starting procedures for main and emergency bilge pump
  - Appropriate valves to operate
- Fire pumps:
  - Starting procedures for main and emergency fire pumps
  - Appropriate valves to operate

Notes: \_\_\_\_\_

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**Inert Gas Systems (IGS):**

*NOTE: Requirements and guidance on inert gas systems is detailed in 46 CFR 32.53, SOLAS 74/78 II-2/62, and MSM Volume II, Chapter C5.*

○ Type of system installed

- Flue gas
- Gas generator
- Nitrogen bottles

○ Sampling / testing of gas pad

Tank Number	% Oxygen	OR	% Nitrogen
		⋮	
		⋮	
		⋮	
Vessel is gas-free or not carrying cargoes required to be inerted			

○ Proper operation of IGS components

- Blowers
  - Free from excessive bearing noise and vibration
  - Remote shutdown for IGS blower
- Scrubber room ventilation
- Primary and alternate saltwater scrubber pumps
- Deck seal
  - Water level
  - Automatic filling
  - Open drain cocks on IG main
- Remote operated / automatic control valves
  - Open or closed indicator
- Gauges
  - Calibration of inline O<sub>2</sub> analyzing equipment
  - Check O<sub>2</sub> and pressure level recordings
- Portable instruments calibrated
- IG generator
  - Combustion control system and fuel supply
  - Interlocking of soot blowers (IGS automatically shuts down when soot blowers engaged)

Notes: \_\_\_\_\_  
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○ Proper operation of IGS audible and visual alarms

- High O<sub>2</sub> content of gas in IGS main
  - Activated at 8% concentration
- Low gas pressure in IGS main downstream of all non-return devices
  - Activated at 100mm (4 inches) water
- High gas pressure in IGS main downstream of all non-return devices
  - Blowers automatically shut down
  - Gas-regulating valves close
- Low / high water level or low flow to deck seal
  - Blowers automatically shut down
- Blowers discharge high temperature
  - Alarms activated at 150°F (65.6°C) or lower
  - Blowers automatically shut down
  - Gas-regulating valves close
- Failure of IGS blowers
  - Gas-regulating valves close
- Low water pressure or flow to flue gas scrubber
  - Blowers automatically shut down
  - Gas-regulating valves close
- High water level in flue gas scrubber
  - Blowers automatically shut down
  - Gas-regulating valves close
- Failure of power supply to automatic control system for gas-regulation valve and indicating devices for IG supply
- IG generator
  - Insufficient fuel supply
  - Failure of power supply to generator or control system for generator

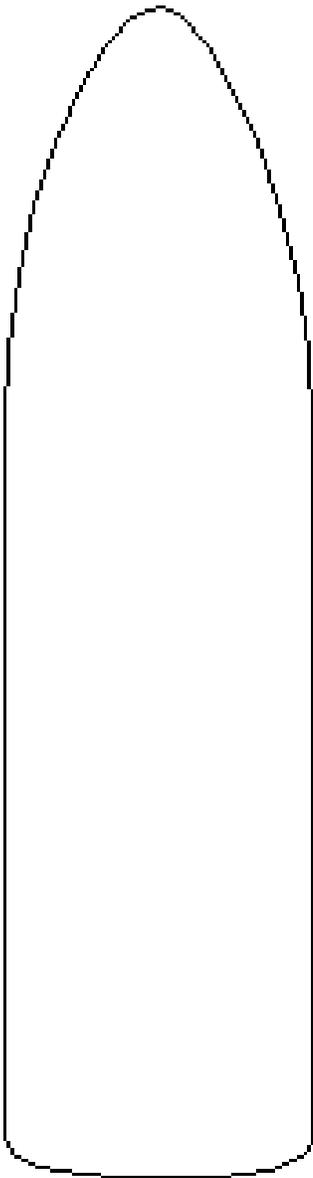
Notes: \_\_\_\_\_

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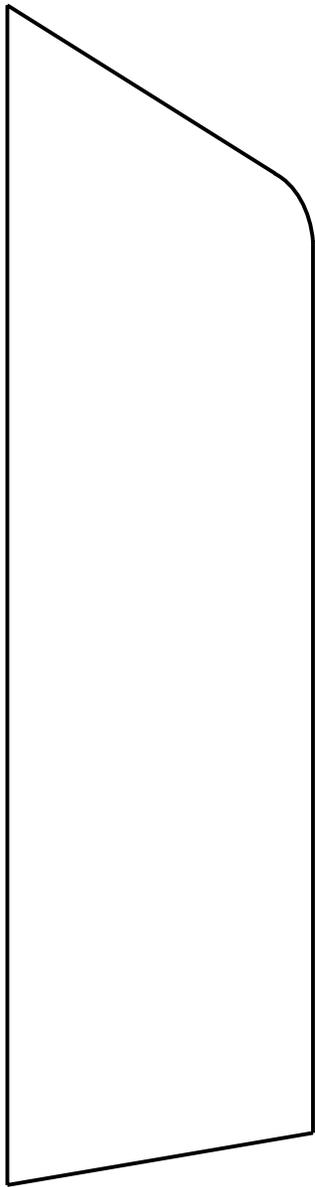
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## Section 8: Appendices

### Vessel Layout:



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



### **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 ACP Vessel Deficiency Procedures:**

<b>Step</b>	<b>Action</b>																
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 exam, go to Step 7.																
5	<p>If deficiency is unable to be corrected prior to end of exam, follow guidance in the tables below.</p> <p>TABLE 1: Minor deficiency discovered by Coast Guard marine inspector*</p> <table border="1"> <thead> <tr> <th><b>Step</b></th> <th><b>Action</b></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Notify ACP class surveyor-in-charge.</td> </tr> <tr> <td>2</td> <td>If ACP class surveyor issues an OSR, go to Step 7.</td> </tr> <tr> <td>3</td> <td>If ACP class surveyor is not available, issue CG-835 to vessel with copy sent to ACP class surveyor-in-charge. Go to Step 6.</td> </tr> </tbody> </table> <p>TABLE 2: Major deficiency that poses a direct and immediate threat to vessel's crew, safety of navigation, or marine environment*</p> <table border="1"> <thead> <tr> <th><b>Step</b></th> <th><b>Action</b></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Notify ACP class surveyor-in-charge of deficiency.</td> </tr> <tr> <td>2</td> <td>Ascertain proposed corrective action.</td> </tr> <tr> <td>3</td> <td>Detain vessel if so determined by OCMI under SOLAS I/19 or MARPOL Article 5.</td> </tr> </tbody> </table> <p>* <b>NOTE:</b> Deficiencies shall indicate the item must be completed to the satisfaction of either the OCMI or ACP class society. The OCMI may deny or revoke the COI for noncompliance with the terms and/or conditions of the deficiencies.</p>	<b>Step</b>	<b>Action</b>	1	Notify ACP class surveyor-in-charge.	2	If ACP class surveyor issues an OSR, go to Step 7.	3	If ACP class surveyor is not available, issue CG-835 to vessel with copy sent to ACP class surveyor-in-charge. Go to Step 6.	<b>Step</b>	<b>Action</b>	1	Notify ACP class surveyor-in-charge of deficiency.	2	Ascertain proposed corrective action.	3	Detain vessel if so determined by OCMI under SOLAS I/19 or MARPOL Article 5.
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1	Notify ACP class surveyor-in-charge of deficiency.																
2	Ascertain proposed corrective action.																
3	Detain vessel if so determined by OCMI under SOLAS I/19 or MARPOL Article 5.																
6	Enter CG-835 data in MIDR.																
7	Enter deficiency data in MSDS.																
8	Initiate Report of Violation (ROV) if necessary.																



## 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	bbbl/LT	m <sup>3</sup> /t	bbbl/m <sup>3</sup>	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
<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	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
<b>Pressure: Bars = Pounds per square inch</b>				
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	