

**Addendum to Annex 2**  
  
**to the AGREEMENT GOVERNING THE DELEGATION OF CERTAIN SURVEY  
AND CERTIFICATION SERVICES  
FOR UNITED STATES OF AMERICA FLAGGED VESSELS**  
**between**  
**UNITED STATES COAST GUARD**  
**and**  
**DET NORSKE VERITAS**

**SUPPLEMENTAL REQUIREMENTS**

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## **1. Introduction**

The supplemental requirements given in this document are those of the United States Coast Guard (USCG) which are contained in Title 46 of the Code of Federal Regulations but not covered by Det Norske Veritas Rules for the Classification of Ships.

The document also contains Statutory Vessel Design, Construction and Equipment Requirements from 46 USC, and U.S. Interpretations related to SOLAS Cargo Ship Safety Construction Certificate where not covered by Det Norske Veritas Rules.

## **2. Supplemental Requirements**

### **2.1 Tonnage Measurements**

There are no supplemental requirements.

### **2.2 Load Line**

There are no supplemental requirements.

### **2.3 SOLAS**

The following supplemental requirements relevant to the issue of all pertaining certificates under SOLAS by DNV are given using the appropriate Code of Federal Regulations (CFR) cite.

#### **2.3.1 Critical Ship Safety Systems Table**

##### **CFR SUBCHAPTER D - TANK VESSELS**

**Cite: 46 CFR 31.36 - 1**

All lifesaving and fire safety equipment shall comply with one of the following, as applicable:

- Coast Guard approved to SOLAS requirements,
- Approved to U.S. national requirements where no SOLAS requirements exist (Applies primarily to certain fire extinguishing and survival equipment),
- Approved under the European Marine Equipment Directive under the conditions specified in the Mutual Recognition Agreement between the United States and the European Commission,
- Norwegian, British or German lifesaving equipment with a letter of acceptance from the Commandant (G-MSE-4),
- Structural fire protection materials and equipment tested and approved to the IMO Fire Test Procedures Code by or on behalf of one of the countries listed below (grandfathered materials and equipment under Annex 3 not included): Countries included are: Canada, Denmark, Germany, Japan, Netherlands, Norway, and United Kingdom.

Reference is given to 46 CFR, Subchapter W, Part 199 on “Lifesaving appliances and arrangements”, where Subparts A to D are valid for vessels subject to SOLAS. These subparts are based on Chapter III of SOLAS. The following items are additional:

46 CFR 199.70 - (a)(1)(iii)

Each lifebuoy stowage position must be marked with either the words “LIFEBUOY” or “LIFE BUOY”, or with the appropriate symbol from IMO Resolution A.760(18).

46 CFR 199.70 - (b)

If the vessel carries inflatable lifejackets, they must be of the same or similar design and have the same method of operation.

46 CFR 199.70 - (b)(3)(i)

Each lifejacket must be marked in block capital letters with the name of the vessel.

46 CFR 199.70 - (c)(2)

Stowage. Each immersion suit or anti-exposure suit must be stowed so they are readily accessible. The stowage positions must be marked with either the words “IMMERSION SUITS” or “ANTI-EXPOSURE SUITS” as appropriate, or with the appropriate symbol from IMO Resolution A.760(18).

46 CFR 199.70 - (c)(3)

Markings. Each immersion suit or anti-exposure suit must be marked in such a way as to identify the person or vessel to which it belongs.

46 CFR 199.110 - (b)

Lifeboats and rescue boats must be arranged to allow safe disembarkation onto the vessel after a drill.

46 CFR 199.130 - (a)(7)

Each survival craft must be stowed so as not to require lifting from its stowed position in order to launch, except that -

- (i) A davit-launched liferaft may be lifted by a manually powered winch from its stowed position to its embarkation position; or
- (ii) A survival craft that weighs 185 kilograms or less may be lifted not more than 300 millimetres in order to launch.

46 CFR 199.130 - (c)(3)

Each liferaft must be arranged to permit it to drop into the water from the deck on which it is stowed.

46 CFR 199.150 - (f)(2)

Each launching appliance must be arranged so that it remains effective under conditions of icing.

46 CFR 199.153 - (e)/(g)

Each unguarded fall must not pass near any operating position of the winch, such as hand cranks, pay out wheels, and brake levers.

Each fall, where exposed to damage or fouling, must have guards or equivalent protection. Each fall that leads along a deck must be covered with a guard that is not more than 300 millimetres above the deck.

46 CFR 199.153 - (f)

The winch drum requirements must be met for all survival craft winches, including multiple drum winches.

46 CFR 199.153 - (i)

The lowering speed for a survival craft loaded with all of its equipment must be not less than 70 percent of the calculated required speed.

46 CFR 199.153 - (j)

The lowering speed for a fully loaded survival craft must be not more than 1.3 metres per second.

46 CFR 199.153 - (l)(2)

The brake pads must, where necessary, be protected from water and oil.

46 CFR 199.170 - (c)(2)

The line-throwing appliance must be supplied with an auxiliary line that:

- (i) Is at least 450 metres long; (ii) Has a breaking strength of at least 40 kiloNewtons; and
- (iii) Is, if synthetic, of a dark color or certified by the manufacturer to be resistant to deterioration from ultra-violet light.

46 CFR 199.175 - (b)(14)

Heaving line. The heaving line must be buoyant, must be at least 30 metres (99 feet) long, must have a buoyant rescue quito attached to one end and should be at least 8 millimetres (5/16 inches) in diameter.

46 CFR 199.175 - (b)(20)

Oars and paddles. Each oar or paddle should have the vessel's name marked in block letters.

46 CFR 199.175 - (b)(28)

Searchlight. The boat must carry two spare bulbs.

46 CFR 199.178

Marking of stowage locations.

- (a) Containers, brackets, racks and similar stowage locations for lifesaving equipment must be marked with symbols in accordance with IMO Resolution A.760(18) indicating the device stowed in that position.
- (b) If more than one device is stowed in a location, the number of devices stowed must be indicated.
- (c) Survival craft should be numbered consecutively starting from the vessel's bow. Survival craft on the starboard side should be numbered with odd numerals and survival craft on the port side should be numbered with even numerals.
- (d) Each liferaft stowage location should be marked with the capacity of the liferaft stowed there.

46 CFR 199.273

Immersion suits must be carried on all cargo vessels except those operating between the 32 degrees north and 32 degrees south latitudes.

46 CFR 199.290 - (b)

On a tank vessel certified to carry cargoes that have a flashpoint less than 60° C as determined under ASTM D93-94, each lifeboat or launching appliance of aluminium construction must be protected by a water spray system meeting the requirements of Part 34, Subchapter 34.25.

**Cite: 46 CFR 32.20 - 5**

The pressure vacuum relief valve shall be of a type and size approved by the Commandant for the purpose intended. For specifications and procedures re approval, see Subpart 162.017.

**Cite: 46 CFR 32.50 - 30**

Cargo hose carried on tank vessels must be suitable for oil service and designed to withstand the pressure of the shutoff head of the cargo pump or the pump relief valve setting, less static head, but in no case less than 150 pounds per square inch.

**Cite: 46 CFR 32.52 - 5(c)**

Means shall be provided for controlling the cargo or pump room bilge pumps and their suction or discharges in order that a flooded pump room may be pumped out. Suitable portable or manually operated pumps may be accepted as complying with this provision, or alternatively, the pump controls shall be arranged so that they are operable from inside the pump room and either from an accessible position outside the pump room, or from the pump room casing above the freeboard deck.

**Cite: 46 CFR 32.53 - 10(b)(1)**

Acceptable types of water seals include the wet and semi-wet type. Other types of seals may be accepted on a case-by-case basis if approval is given by the Coast Guard Marine Safety Center.

**Cite: 46 CFR 34.15 - 10(f)**

The delayed discharge and alarm can be omitted only for spaces which have a suitable horizontal escape.

**Cite: 46 CFR 34.15 - 10(g)**

All distribution valves and controls shall be of an approved type.

**Cite: 46 CFR 34.15 - 15(c)**

All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

**Cite: 46 CFR 34.15 – 20(i)**

All CO<sub>2</sub> storage cylinders shall be of an approved type.

**Cite: 46 CFR 34.15 - 30(a)**

The alarm in spaces required to have a delayed discharge and are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, shall depend on no source of power other than the carbon dioxide.

**Cite: 46 CFR 34.20 – 10(a)**

Foam systems shall be of an approved type.

**Cite: 46 CFR 34.20 - 10(e)**

The deck foam system on each tankship that has a keel laying date on or after January 1, 1975, must be capable of being actuated, including introduction of foam to the foam main, within three minutes of notification of a fire.

**Cite: 46 CFR 34.20 - 15(b)**

All piping, valves and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved by the Commandant.

**Cite: 46 CFR 34.25 - 15(b)**

Distribution piping shall be of materials resistant to corrosion, except that steel or iron may be used if inside and outside corrosion resistant coatings which will not flake off and clog the nozzles are applied. Materials readily rendered ineffective by heat of a fire shall not be used. The piping shall be subject to approval for each installation.

**Cite: 46 CFR 34.50**

All portable and semi-portable extinguishers shall be of an approved type.

**Cite: 46 CFR 35.30 - 20(c)(1)**

Each self-contained breathing apparatus must be approved by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH).

## CFR SUBCHAPTER F - MARINE ENGINEERING

**Cite: 46 CFR 52.01 - 2**

Boilers, pressure vessels and heat exchangers are to comply with the requirements in Part 4, Ch. 3 of the DNV Rules or the ASME Code with additional requirements as given below. Other recognized international standards will be evaluated on a case by case basis.

**Cite: 46 CFR 52.01 – 50**

For water tube boilers with working pressure less than 30 psig and other boilers having a steam temperature less than 425° F (218° C) is required to have fusion plugs.

**Cite: 46 CFR 52.01 - 120(a)(7)**

On new installations the safety valve nominal size for propulsion boilers and superheaters must not be less than 38 mm (1 1/2 in.) nor more than 102 mm (4 in.). Safety valves 38 mm to 114 mm (4 1/2 in.) may be used for replacements on existing boilers. The safety valve size for auxiliary boilers must be between 19 mm (3/4 in.) and 102 mm.

Cast iron seats and disks are not permitted.

**Cite: 46 CFR 53.01 - 3**

Heating boilers for applications below 95° C and steam boilers with pressure less than 3.5 bar not covered by DNV Rules, are to be designed, constructed, inspected and tested according to this regulation. Cast iron seats and disks are not permitted.

**Cite: 46 CFR 53.05**

Pressure relieving devices.

Cast iron seats and disks are not permitted.

**Cite: 46 CFR 54.01 – 2**

Pressure vessels are to be built in accordance with 46 CFR 54.01 – 2 and Div. 1, Section VIII of ASME Code respectively. Other recognized international standards will be evaluated on a case by case basis.

**Cite: 46 CFR 54.10 – 10**

Pressure vessels with a design temperature greater than (>) 650 deg. F (343 deg. C) must be tested in accordance with 46 CFR 54.10 – 10 and Div. 1, Section VIII of ASME Code respectively.

**Cite: 46 CFR 54.10- -15**

Pneumatic tests of pressure vessels are normally not allowed by DNV.

**Cite: 46 CFR 54.15**

Pressure vessels: Pressure relief devices.

Cast iron seats and disks are not permitted.

**Cite: 46 CFR 56.15**

In Pt. 4 Ch. 1 Sec.7 A 102 gas welding is not to be used for pipes with outer diameter greater than 76.1 mm.

In Pt. 4 Ch. 1 Sec. 7 A 500, fittings 76.1 mm and below, 1 fitting from lot of 100 or fraction thereof must be flattened cold until the opposite walls meet without developing any cracks.

**Cite: 46 CFR 56.20 -15**

Valves in which the closure is accomplished by resilient non-metallic materials instead of metal to metal seating are to comply with the performance criteria and category of positive shut-off valves specified in this regulation.

Alternative arrangements for acceptance of resilient seated valves is outlined by Federal Register, March 4, 1998.(63 FR 10547).

**Cite: 46 CFR 56.50 – 55**

Bilge pumps.

Multi-hulled vessels require two means for pumping in each hull.

**Cite: 46 CFR 56.50 - 65(b)(1)**

All vessels having oil fired boilers must have at least two fuel service pumps, each of sufficient capacity to supply all the boilers at full power, and arranged so that one may be overhauled while the other is in service. At least two fuel oil heaters of approximately equal capacity must be installed and so arranged that any heater may be overhauled while the other(s) is (are) in service. Suction and discharge strainers must be of the duplex or other type capable of being cleaned without interrupting the oil supply.

**Cite: 46 CFR 56.50 – 85**

Tank vent air pipes for fuel oil tanks must not be less than 2 ½ in. (63.5 mm).

**Cite: 46 CFR 56.70**

**Welding**

Welding procedures are to be in accordance with the details found in 46 CFR 56.70 and ASME Section IX ( alternatively EN 288), respectively.

**Cite: 46 CFR 56. 97**

Pressure testing may not be waived for small bore pipes as specified in Pt. 4 Ch. 1 Sec. 7 E 102. Pipes must be hydrostatically tested regardless of radiographic examination as specified in Pt. 4 Ch. 1 Sec. 7 E 202. Pressure testing of non-standard piping system components shall meet 46 CFR 56.97 – 5.

**Cite: 46 CFR 58.10 - 5**

**Gasoline engine installations.**

- (a) Engine design. All installations shall be of marine type engines suitable for the intended service, designed and constructed in conformance with the requirements of this subchapter.
- (b) Carburetors. (1) Drip collectors shall be fitted under all carburetors, except the down-draft type, to prevent fuel leakage from reaching the bilges and so arranged as to permit ready removal of such fuel leakage. Drip collectors shall be covered with flame screens.

NOTE: It is recommended that drip collectors be drained by a device for automatic return of all drip to engine air intakes.

(2) All gasoline engines must be equipped with an acceptable means of backfire flame control. Installations of backfire flame arresters bearing basic Approval Nos. 162.015 or 162.041 or engine air and fuel induction systems bearing basic Approval Nos. 162.015 or 162.042 may be continued in use as long as they are serviceable and in good condition. New installations or replacements must meet the applicable requirements of this section.

(3) The following are acceptable means of backfire flame control for gasoline engines:

- (i) A backfire flame arrester complying with SAE J–1928 or UL 1111 and marked accordingly. The flame arrester must be suitably secured to the air intake with a flamtight connection.
- (ii) An engine air and fuel induction system which provides adequate protection from propagation of backfire flame to the atmosphere equivalent to that provided by an acceptable backfire flame arrester. A gasoline engine utilizing an air and fuel induction system, and operated without an approved backfire flame arrester, must either include a reed valve assembly or be installed in accordance with SAE J–1928.
- (iii) An arrangement of the carburetor or engine air induction system that will disperse any flames caused by engine backfire. The flames must be dispersed to the atmosphere outside the vessel in such a manner that the flames will not endanger the vessel, persons, on board, or nearby vessels and structures. Flame dispersion may be achieved by attachments to the carburetor or location of the engine air induction system. All attachments must be of metallic construction with flamtight connections and firmly secured to withstand vibration, shock, and engine backfire. Such installations do not require formal approval and labeling but must comply with this sub-part.
- (c) Exhaust manifold. The exhaust manifold shall either be water-jacketed and cooled by discharge from a pump which operates whenever the engine is running, or woodwork within nine inches shall be protected by ¼ inch asbestos board covered with not less than No. 22 USSG (U.S. standard gage) galvanized sheet iron or non-ferrous metal.



A dead air space of 1/4 -inch shall be left between the protecting asbestos and the wood, and a clearance of not less than two inches maintained between the manifold and the surface of such protection.

(d) Exhaust pipe. (1) Exhaust pipe installations shall conform to the requirements of the American Boat and Yacht Council Standard P-1 "Safe Installation for Exhaust Systems" and National Fire Protection Association Standard NFPA 302, part 1, section 23 and the following additional requirements:

(i) All exhaust installations with pressures in excess of 15 pounds per square inch gage or employing runs passing through living or working spaces shall meet the material requirements of part 56 of this subchapter.

(ii) Horizontal dry exhaust pipes are permitted only if they do not pass through living or berthing spaces, they terminate above the deepest load waterline and are so arranged as to prevent entry of cold water from rough or boarding seas, and they are constructed of corrosion resisting material "at the hull penetration."

**Cite: 46 CFR 58.10 – 15(f)**

(f) Automatic shutdown. (1) The control system shall be designed for automatic shutdown of the engine with actuation of audible and visible alarms at shutdown. The visible malfunction indicator shall indicate what condition caused the shutdown and remain visible until reset. Automatic shutdown shall occur under the following conditions:

(i) Overspeed.

(ii) Low lubricating oil pressure. Consideration will be given providing alarm only (without shutdown) in those cases where suitable antifriction bearings are fitted.

(2) Audible or visible alarms shall also be provided for:

(i) Excessive gas temperature, measured at the turbine inlet, gas generator, interstage turbine or turbine exhaust.

(ii) Excessive lubricating oil temperature.

(iii) Excessive speed.

(iv) Reduced lubricating oil pressure.

(3) A remote, manually operated shutdown device shall be provided. Such device may be totally mechanical or may be electrical with a manually actuated switch.

**Cite: 46 CFR 61.05 - 10**

Hydrostatic testing and survey of boilers is to be carried out with intervals and extent as given in this regulation.

**Cite: 46 CFR 61.10 - 5**

Hydrostatic testing and survey of pressure vessels is to be carried out with intervals and extent as given in this regulation.

**Cite: 46 CFR 61.15 - 10**

Liquefied petroleum gas piping for heating and cooking are to be tested as required in this regulation.

**Cite: 46 CFR 61.15 - 12**

Non-metallic expansion joints must be surveyed and replaced as required in this regulation.

**Cite: 46 CFR 62.20 - 3(a)(2)**

A planned maintenance program for all vital systems. Covered for E0-class.

**Cite: 46 CFR 62.25 - 20(d)(4)**

(4) Flooding safety, fire, loss of power and engineer's assistance-needed alarms extended from the machinery spaces to a remote location must not have a duty crewmember selector.

Note: Other alarms may be provided with such a selector, provided there is no off position.

**Cite: 46 CFR 62.35 - 5(e)**

(e) Control system details. (1) Each operator control device must have a detent at the zero thrust position.

**Cite: 46 CFR 62.35 - 15(a)**

All required fire pump remote control locations must include the controls necessary to charge the fire main and -

(1) A firemain pressure indicator; or

(2) A firemain low pressure alarm.

**Cite: 46 CFR 62.35 - 50(a)**

From Table 62.35 - 50 the personnel monitoring and safety control requirement is to be adopted.

**Cite: 46 CFR 63.20 - 1**

(a) Primary safety control system.

Following emergency safety trip control operation, the airflow to the boiler must not automatically increase. For this condition post-purge must be accomplished manually

(c) Float chamber low water cut-off controls using stuffing boxes to transmit the motion of the float from the chamber to the external switches are prohibited.

## CFR SUBCHAPTER H - PASSENGER VESSELS

### **Cite: 46 CFR 70.28 - 1**

All lifesaving and fire safety equipment shall comply with one of the following, as applicable:

- Coast Guard approved to SOLAS requirements,
- Approved to U.S. national requirements where no SOLAS requirements exist (Applies primarily to certain fire extinguishing and survival equipment.),
- Approved under the European Marine Equipment Directive under the conditions specified in the Mutual Recognition Agreement between the United States and the European Commission,
- Norwegian, British or German lifesaving equipment with a letter of acceptance from the Commandant (G-MSE-4),
- Structural fire protection materials and equipment tested and approved to the IMO Fire Test Procedures Code by or on behalf of one of the countries listed below (grandfathered materials and equipment under Annex 3 not included): Countries included are: Canada, Denmark, Germany, Japan, Netherlands, Norway, and United Kingdom.

Reference is given to 46 CFR, Subchapter W, Part 199 on “Lifesaving appliances and arrangements”, where Subparts A to D are valid for vessels subject to SOLAS. These subparts are based on Chapter III of SOLAS. Additional items not covered by SOLAS are the same as given for tankers in 46 CFR 31.36 - 1 on page 2.

The following items are additional for passenger vessels:

#### 46 CFR 199.70 - (b)(2)

Each child-size lifejacket and immersion suit must be appropriately marked and stowed separately from adult or extended-size devices.

#### 46 CFR 199.80 - (c)(5)

Instructions for passengers must include illustrated instructions on the method of donning lifejackets.

#### 46 CFR 199.214

Passenger ships.

Immersion suits are not required for passenger vessels operating only on routes between 32 degrees north and 32 degrees south latitudes.

### **Cite: 46 CFR 72.15 - 10**

#### **Ventilation on vessels using fuel having a flash point of 110° F. (43° C) or lower.**

- (a) Where liquid fuel having a flashpoint of 110 degrees F. or lower is used for main or auxiliary machinery or for starting purposes, the spaces containing such machinery or fuel tanks shall have natural supply and mechanical ventilation as required by this section.
- (b) The requirements for the mechanical exhaust system shall be such as to assure the air changes as noted in table 72.15–10(b), depending upon the size of the space.

TABLE 72.15–10(B)

Over	Size of space in cubic feet	Not over	Minutes per air change
		500	2
500		1000	3
1000		1500	4
1500			5

(c) Exhaust blower motors shall be outside of the ducts, and if mounted in any compartment required to be ventilated by this section, shall be of the explosion proof type. Blower blades shall be non-sparking with reference to their housings.

(d) Exhaust blower switches shall be located outside of any space required to be ventilated by this section, and shall be of the type interlocked with the ignition switch so that the blowers are started before the engine ignition is switched on. A red warning sign at the switch shall state that the blowers shall be operated prior to starting the engines for a sufficient time to insure at least one complete change of air in the compartments.

(e) The area of the ducts shall be such as to limit the air velocity to a maximum of 2,000 feet per minute.

Ducts may be of any shape, provided that in no case shall 1 dimension exceed twice the other.

(f) At least 2 inlet ducts shall be located at 1 end of the compartment and they shall extend to the lowest part of the compartment or bilge on each side. Similar exhaust ducts shall be led to the mechanical exhaust system from the lowest part of the compartment or bilge on each side of the compartment at the end opposite from that at which the inlet ducts are fitted.

(g) All ducts shall be constructed of non-ferrous metal or galvanized ferrous metal not less than No. 22 USSG, intact and gas tight from end to end and shall be of substantial construction. The ducts shall lead as direct as possible and be properly fastened and supported.

(h) All supply ducts shall be provided with cowls or scoops having a free area not less than twice the required duct area. When the cowls or scoops are screened, the mouth area shall be increased to compensate for the area of the screen wire. Dampers shall not be fitted in the supply ducts. Cowls or scoops shall be kept open at all times except when the stress of weather is such as to endanger the vessel if the openings are not temporarily closed. Supply and exhaust openings shall not be located where the natural flow of air is unduly obstructed, or adjacent to possible sources of vapor ignition, nor shall they be so located that exhaust air may be taken into the supply vents.

**Cite: 46 CFR 72.15 - 15(c)(2)**

**Ventilation for closed spaces.**

(2) The quantity of ventilating air shall be not less than 1 cubic foot per minute per square foot of deck area.

**Cite: 46 CFR 72.15 - 20**

**Ventilation for crew quarters and passenger spaces.**

(a) All crew and passenger spaces shall be adequately ventilated in a manner suitable to the purpose of the space.

(b) On vessels of 100 gross tons and over, except for such spaces as are so located that under all ordinary conditions of weather, windows, ports, sky-lights, etc., and doors to passageways

can be kept open, all crew spaces shall be ventilated by a mechanical system, unless it can be shown that a natural system will provide adequate ventilation. However, vessels which trade regularly in the tropics shall, in general, be fitted with a mechanical ventilation

**Cite: 46 CFR 72.40 - 10**

Storm rails.

Suitable storm rails shall be installed in all passageways and at the deckhouse sides where passengers or crew might have normal access. Storm rails shall be installed on both sides of passageways which are 6 feet or more in width.

**Cite: 46 CFR 76.05 - 20**

Fixed fire extinguishing systems must be installed, as required by table 76.05-1(a).

**Cite: 46 CFR 76.15 - 10(f)**

The delayed discharge and alarm can be omitted only for spaces which have a suitable horizontal escape.

**Cite: 46 CFR 76.15 - 10(g)**

All distribution valves and controls shall be of an approved type.

**Cite: 46 CFR 76.15 - 15(c)**

All piping, valves and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

**Cite: 46 CFR 76.15 – 20(i)**

All CO<sub>2</sub> storage cylinders shall be of an approved type.

**Cite: 46 CFR 76.15 - 30(a)**

The alarm in spaces required to have a delayed discharge and are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, shall depend on no source of power other than the carbon dioxide.

**Cite: 46 CFR 76.23 - 20(b)**

All piping, valves and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

**Cite: 46 CFR 76.25 – 1**

Automatic sprinkler systems must comply with NFPA 13-1996.

**Cite: 46 CFR 76.27 – 15(b)**

The detectors, the detecting cabinets and alarms shall be of an approved type.

**Cite: 46 CFR 76.27 – 15(e)**

All wiring and electrical circuits and equipment shall meet the applicable requirements of subchapter J.

**Cite: 46 CFR 76.33 – 20(e)**

The smoke detection system shall be of an approved type.

**Cite: 46 CFR 76.33 – 20(f)**

All wiring and electrical circuits shall meet the applicable requirements of subchapter J.

**Cite: 46 CFR 76.35 – 15(b)**

The manual alarm system shall be of an approved type.

**Cite: 46 CFR 76.35 – 15(d)**

All wiring and electrical circuits shall meet the applicable requirements of subchapter J.

**Cite: 46 CFR 76.50**

All portable and semi-portable extinguishers shall be of an approved type.

#### CFR SUBCHAPTER I - CARGO AND MISCELLANEOUS VESSELS

**Cite: 46 CFR 90.27 - 1**

All lifesaving and fire safety equipment shall comply with one of the following, as applicable:

- Coast Guard approved to SOLAS requirements,
- Approved to U.S. national requirements where no SOLAS requirements exist (Applies primarily to certain fire extinguishing and survival equipment.),
- Approved under the European Marine Equipment Directive under the conditions specified in the Mutual Recognition Agreement between the United States and the European Commission,
- Norwegian, British or German lifesaving equipment with a letter of acceptance from the Commandant (G-MSE-4),
- Structural fire protection materials and equipment tested and approved to the IMO Fire Test Procedures Code by or on behalf of one of the countries listed below (grandfathered materials and equipment under Annex 3 not included): Countries included are: Canada, Denmark, Germany, Japan, Netherlands, Norway, and United Kingdom.

Reference is given to 46 CFR, Subchapter W, Part 199 on “Lifesaving appliances and arrangements”, where Subparts A to D are valid for vessels subject to SOLAS. These subparts are based on Chapter III of SOLAS. Additional items not covered by SOLAS are the same as given for tankers in 46 CFR 31.36 - 1 on page 2. In addition to the tanker list, provisions relating to children and passengers should be included, if the vessel carries up to 12 passengers.

**46 CFR 199.70 - (b)(2)**

Each child-size lifejacket and immersion suit must be appropriately marked and stowed separately from adult or extended-size devices.

**46 CFR 199. 80(c)(5)**

Instructions for passengers must include illustrated instructions on the method of donning lifejackets.

**Cite: 46 CFR 92.07 - 1(c)**

The CFR-text accepts the SOLAS method 1C, as adopted in the DNV Rules.

**Cite: 46 CFR 92.15 - 5, 10 and 15**

**5. Ventilation for vessels using fuel having a flashpoint of 110° F. (43° C) or lower.**

(a) Where liquid fuel having a flashpoint of 110 degrees F. or lower is used for main or auxiliary machinery or for starting purposes, the spaces containing such machinery or fuel tanks shall have ventilation as required by this section.

(1) At least 2 ventilators fitted with cowls or their equivalent for the purpose of properly and effectively ventilating the bilges of every engine and fuel-tank compartment in order to remove any flammable or explosive gases.

(2) Vessels constructed so that the greater portions of the bilges under the engine and fuel tanks are open or exposed to the natural atmosphere at all times are not required to be fitted with ventilators.

**10. Ventilation for closed spaces.**

(a) Except as noted in paragraph (c) of this section, all enclosed spaces within the vessel shall be properly vented or ventilated. Means shall be provided to close off all vents and ventilators.

(b) Means shall be provided for stopping all fans in ventilation systems serving machinery and cargo spaces and for closing all doorways, ventilators and annular spaces around funnels and other openings to such spaces, from outside these spaces, in case of fire.

(c) On unmanned cargo barges not fitted with a fixed bilge system, vents and ventilators may be omitted from void spaces.

(d) The ventilation of spaces which are “specially suitable for vehicles” shall be in accordance with the provisions of this paragraph. In addition, if vehicles are operated inside of enclosed spaces, the ventilation shall be in accordance with subpart 97.80 of this subchapter.

(1) The quantity of ventilating air shall be not less than 1 cubic foot per minute per square foot of deck area.

(2) The ventilation system shall be such as to prevent air stratification as well as to prevent the accumulation of air pockets.

(3) An alarm system shall be provided which will indicate the loss of required ventilation. The alarm location shall be in a normally manned space acceptable to the Commandant.

(e) For requirements regarding controls of electrically powered ventilation systems, see subchapter J (Electrical Engineering) of this chapter.

**15. Ventilation for crew quarters and, where provided, passenger spaces.**

(a) All living spaces shall be adequately ventilated in a manner suitable to the purpose of the space.

(b) On vessels of 100 gross tons and over, except for such spaces as are so located that under all ordinary conditions of weather, windows, ports, sky-lights, etc., and doors to passageways can be kept open, all crew spaces shall be ventilated by a mechanical system, unless it can be shown that a natural system will provide adequate ventilation. However, vessels which trade regularly in the tropics shall, in general, be fitted with a mechanical ventilation system.

**Cite: 46 CFR 92.25 – 10(a)**

Storm rails.

(a) On vessels in ocean and coastwise service, suitable storm rails shall be installed in all passageways and at deckhouse sides where persons on board might have normal access. Storm rails shall be installed on both sides of passageways which are 6 feet or more in width.

**Cite: 46 CFR 95.10 - 10(a)**

Fire hose, hydrants and nozzles.

The size of fire hydrants, hose, and nozzles and the length of hose required shall be as noted in Table 95.10 – 5(a).

With respect to this Supplement, the requirement for hydrant and hose size on passenger and cargo vessels of 1500 gross tons and over is relevant. In said table, the minimum size is given as 2-1/2 inch (65 mm) for a hose length of 50 feet.

The hydrants in interior locations may, however, have siamese connections for 1-1/2 inch (40 mm). In these cases, the hose shall be 75 feet in length, and only one hose will be required at each fire station. However, if all such stations can be satisfactorily served with 50 foot lengths, 50 foot hose may be used.

For hydrants in exterior locations on vessels in other than ocean or coastwise service, 50 feet of 1-1/2 inch (40 mm) hose may be used.

**Cite: 46 CFR 95.15 - 10(f)**

The delayed discharge and alarm can be omitted only for spaces which have a suitable horizontal escape.

**Cite: 46 CFR 95.15 - 10(g)**

All distribution valves and controls shall be of an approved type.

**Cite: 46 CFR 95.15 - 15(c)**

All piping, valves and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

**Cite: 46 CFR 95.15 – 20(i)**

All CO<sub>2</sub> storage cylinders shall be of an approved type.

**Cite: 46 CFR 95.15 - 30(a)**

The alarm in spaces required to have a delayed discharge and are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, shall depend on no source of power other than the carbon dioxide.

**Cite: 46 CFR 95.50**

All portable and semi-portable extinguishers shall be of an approved type.

**Cite: 46 CFR 98.25**

CFR-text applicable to vessels other than required to comply with Part 154 (Gas Carriers). DNV does not accept carriage of anhydrous ammonia in bulk on other vessels than gas carriers.



**Cite: 45 CFR 98.30 - 3**

CFR-text applicable for transfer of flammable, combustible and other hazardous materials to or from portable tanks on vessels. DNV does normally not accept transfer of above materials to or from portable tanks on vessels.

Exemptions have been given for heli-fuel and offshore supply vessels. Portable tanks required to be IMDG certified. This covers CFR-text except for annual inspection of pressure/vacuum devices.

**CFR SUBCHAPTER J - ELECTRICAL ENGINEERING**

**Cite: 46 CFR 111.12 - 1(c)**

Each prime mover must shut down automatically upon loss of lubricating pressure to the generator bearings if the generator is directly coupled to the engine. If the generator is operating from a power take-off, such as a shaft driven generator on a main propulsion engine, the generator must automatically declutch (disconnect) from the prime mover upon loss of lubricating pressure to generator bearings.

**Cite: 46 CFR 111.12 – 9(a)**

The current-carrying capacity of generator cables must not be:

- (1) Less than 115 percent of the continuous generator rating; or
- (2) Less than 115 percent of the over load for a machine with a 2 hour or greater overload rating.

**Cite: 46 CFR 111.60 - 4(a)**

Each power and lighting cable conductor must be #14 AWG (2.10 mm<sup>2</sup>) or larger.

**Cite: 46 CFR 111.60 – 7**

Demand loads.

Generator, feeder and bus-tie cables must be selected on the basis of a computed load of not less than given in the following table:

Type of circuit	Demand load
Generator cables	115 percent of continuous generator rating
Switchboard bus-tie, except ship's service to emergency switchboard bus-tie	75 percent of generating capacity of the larger switchboard
Emergency switchboard bus-tie	115 percent of continuous rating of emergency switchboard
Motor feeders	Article 430, National Electric Code
Galley equipment feeder	100 percent of either the first 50 KW or one-half the connected load, whichever is the larger, plus 65 percent of the remaining connected load, plus 50 percent of the rating of the spare switches or circuit breakers in the distribution panel.
Lighting feeder	100 percent of the load plus the average active circuit load for the spare switches or circuit breakers on the distribution panels.
Grounded neutral of a dual voltage leader	100 percent of the capacity of the ungrounded conductors when grounded neutral is not protected by a circuit breaker overcurrent trip, or not less than 50 percent of the capacity of the ungrounded conductors when the grounded neutral is protected by a circuit breaker overcurrent trip or overcurrent alarm.

**Cite: 46 CFR 111.60 - 19(a)**

A cable must not be spliced in a hazardous location, except in intrinsically safe systems.

**Cite: 46 CFR 111.75 - 5(b)**

Connected load. The connected load on a lighting branch circuit must not be more than 80 percent of the rating of the overcurrent protective device, computed on the basis of the fixture ratings and in accordance with IEEE Std 45, section 21.6.

**Cite: 46 CFR 111.75 - 17(d)(2)**

Requirement for navigation light to be independently lab. tested to UL 1104 or an equivalent standard.

**Cite: 46 CFR 111.95**

#### **Electric Power-Operated Boat Winches**

##### **§ 111.95–1 Applicability.**

(a) The electric installation of each electric power-operated boat winch must meet the requirements in this subpart, except that limit switches must be adapted to the installation if there are no gravity davits.

(b) The provisions of this subpart supplement the requirements for boat winches in other parts of this chapter under which vessels are certificated and in subchapter Q, Equipment approvals.

##### **§ 111.95–3 General requirements.**

(b) Each main line emergency disconnecting switch, if accessible to an unauthorized person, must have a means to lock the switch in the open-circuit position with a padlock or its equivalent. The switch must not lock in the closed-circuit position.

**§ 111.95–7 Wiring of boat winch components.**

(a) If the motor controller of a boat winch power unit is next to the winch, the main line emergency switch must disconnect all parts of the boat winch power unit, including the motor controller and limit switches, from all sources of potential. Other power circuit switches must be connected in series with the main line emergency switch and must be ahead of the motor controller. The main line emergency switch must be the motor and controller disconnect required by Subpart 111.70 and must have a horsepower rating of at least that of the winch motor.

(b) If the motor controller of a boat winch power unit is remote from the winch, there must be a switch at the controller that can disconnect the entire winch electric installation from all sources of potential. The switch must be in series with and on the supply side of the main line emergency switch.

(c) Each davit arm limit switch, whether connected in the power circuit or in the control circuit, must disconnect all ungrounded conductors of the circuit controlled.

(d) If one motor is used with two winches, there must be a main line emergency switch, a clutch interlock switch, and a master switch for each winch, except that a single main line emergency switch located as required by paragraph (e) of this section may be used for both winches. The main line emergency switches must be connected, in series, ahead of the motor controller. The master switches must be connected in parallel and each, in series, with the corresponding clutch interlock switch for that winch. Each clutch interlock switch must open the circuit to its master switch, except when the power unit is clutched to the associated winch. There must be a means to prevent the power unit from being clutched to both winches simultaneously.

(e) The main line emergency disconnecting switch must be adjacent to the master switch, within reach of the winch operator, accessible to the person in charge of the boat stowage, and for gravity davit installations, in a position from which the movement of boat davit arms can be observed as they approach the final stowed position.

**Cite: 46 CFR 112.05 – 3**

Main emergency bus-tie.

Each bus-tie between a main switchboard and an emergency switchboard must:

- (a) Disconnect automatically upon loss of potential at the emergency switchboard;
- (b) Be arranged to prevent parallel operation of an emergency power source with any other source of electric power, except for interlock systems for momentary transfer of loads; and
- (c) If arranged for feedback operation, open automatically upon overload of the emergency power source before the emergency power source is tripped off the line from the overload.

**Cite: 46 CFR 112.05 – 5(b)**

A stop control for an emergency generator must be only in the space that has the emergency generator, except a remote mechanical reach rod is permitted for the fuel oil shut-off valve to an independent fuel oil tank located in the space.

**Cite: 46 CFR 112.15 - 1 & 5**

Final (including temporary) emergency loads.

On vessels required to have final emergency power sources, the following emergency lighting and power loads must be arranged so that they can be energized from the final emergency power source:

- 1(e) Illumination to allow safe operation of each power operated watertight door.
  - (f) At least one light in each space where a person may be maintaining, repairing or operating equipment, stowing or drawing stores or equipment, or transiting, such as public spaces, work spaces, machinery spaces, workshops, galleys, bow thruster rooms, storage areas, underdeck passageways in cargo areas, windlass rooms, accessible duct keels with valve operators, cargo handling rooms and holds of roll-on/roll-off vessels.
  - (q) All lighting relative to helicopter operations and landing if installed, unless provided by another source power (such as independent batteries separately charged by solar cells).
  - (r) Each general emergency alarm system required by SOLAS 74.
- 5(c) Each charging panel for:
- (1) Temporary emergency batteries;
  - (2) Starting batteries for diesel engines or gas turbines that drive emergency generators; and
  - (3) General alarm batteries.
- (g) If necessary, the lube oil pump for each propulsion turbine and reduction gear, propulsion diesel reduction gear, and ship's service generator turbine which needs external lubrication.
  - (h) Each rudder angle indicator.
  - (l) Each general emergency flashing light required.
  - (m) Each blow-out-preventer control system.
  - (n) Any permanently installed diving equipment that is dependent upon the vessel's power.
  - (o) Each emergency generator starting compressor.
  - (r) Each vital system automation load required.
  - (s) Motor-operated valves for each cargo oil and fuel oil system, if the emergency power source is the source of power.

- (t) Each ship's stabilizer wing, unless a separate source of emergency power is supplied.
- (u) Each indicator that shows the position of the stabilizer wings.
- (v) Each smoke extraction fan (not including smoke detector sampling).

**Cite: 46 CFR 112.20 – 15**

Transfer of emergency loads.

- (a) When the potential of the final emergency power source reaches 85 to 95 percent of normal value, the emergency loads under 112.15 - 5 must transfer automatically to the final emergency power source and, on a passenger vessel, this transfer must be accomplished in no more than 45 seconds after failure of the normal source of power.
- (b) When the potential from the normal source has been restored, the emergency loads must be manually or automatically transferred to the normal source, and the final emergency power source must be manually or automatically stopped.
- (c) If the potential of the final emergency power source is less than 75 to 85 percent of normal value while supplying the emergency loads, the temporary emergency loads under 112.15 – 1 must transfer automatically to the temporary emergency power source.

**Cite: 46 CFR 112.50 - 1(g)**

The generator set must shut down automatically upon loss of lubricating oil pressure, over-speed, or operation of a fixed fire extinguishing system in the emergency generator room (see § 111.12–1(b) for detailed overspeed trip requirements).

**Cite: 46 CFR 112.55 - 5**

When supplying emergency lighting loads, the storage battery initial voltage must not exceed the standard system voltage by more than 5 percent.

**Cite: 46 CFR 112.55 - 10(d)**

Storage battery charging.

There must be instruments to show the rate of charge.

**Cite: 46 CFR 113.43 - 1,3,5**

1. This subpart applies to each vessel of 1600 gross tons and over that has power driven main or auxiliary steering gear.

3(a). Each vessel must have steering failure alarm system that actuates an audible and visible alarm in the pilothouse when the actual position of the rudder differs by more than 5 degrees from the rudder position ordered by the follow-up control systems, for more than:

- (1) 30 seconds for ordered rudder position changes of 70 degrees;
- (2) 6.5 seconds for ordered rudder position changes of 5 degrees; and
- (3) The time period calculated by the following formula for ordered rudder position changes between 5 degrees and 70 degrees:

$$t = (R / 2.76) + 4.64$$

Where t = maximum time delay in seconds and R = ordered rudder change in degrees.

5. Each steering failure system must be supplied by a circuit that is independent of other steering gear alarm circuits.

### **2.3.2 Stability**

There are no supplemental requirements.

### **2.3.3 Structures**

There are no supplemental requirements.

### **2.3.4 Statutory Vessel Design, Construction and Equipment Requirements from 46 USC**

**Cite: 3503(a)**

CFR 72.05 – 20 Stairways, ladders and elevators.

Text partly covered in DNV rules Pt. 5 Ch. 2 Sec.2 E 1000. Additional items to be obtained from CFR text by direct comparison.

**Cite: 3703(a)**

CFR 157.10d Tank vessel construction standard.

(c) Except on a vessel to which § 157.10d(d) applies (vessel of less than 10,000 DWT that is constructed for service exclusively on inland and limited, short, protected coastwise routes), tanks within the cargo tank length that carry any oil must be protected by double sides and a double bottom as follows:

(1)(ii) For a tank vessel of less than 5,000 DWT the molded width of the double side, at any cross section, measured at right angles to the side shell plating, from the side of tanks containing oil to the side shell plating, must not be less than the distance  $w$  as shown in Fig. 157.10d(c) and specified as follows:

$w = [0.4 + (2.4)(DWT/20,000)]$  meters, but in no case less than 0.76 meter (30 in.).

**Cite: 3719**

Reduction of spills from single hull non-self-propelled tank vessels by:

- (1) A crew member and an operable anchor equipment.
- (2) Carrying an emergency tow wire or tow line rigged and ready for use.
- (3) The emergency tow wire or tow line to have the same towing characteristics as the primary tow wire or tow line.

### **Additional Items on Fire Safety – Tank Vessels**

**Cite: 46 CFR 34.15 – 10(c)**

One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space.

**Cite: 46 CFR 34.15 - 10(e)**

Where provisions are made for the simultaneous release of a give amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the

cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

**Cite: 46 CFR 34.15 – 35(a)**

Except for cargo spaces, the operation of the carbon dioxide system shall automatically shut down any mechanical ventilation to that space. This will not be required where the carbon dioxide system is a secondary system in addition to another approved primary system protecting the space.

**Cite: 46 CFR 34.15 – 40**

Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

**Cite: 46 CFR 35.40 - 7**

Adjacent to all carbon dioxide fire extinguishing alarms there shall be conspicuously marked: “WHEN ALARM SOUNDS VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED.”

**Cite: 46 CFR 35.40 - 10**

Foam or CO<sub>2</sub> room shall be marked: “FOAM FIRE APPARATUS” or “CO<sub>2</sub> FIRE APPARATUS” as appropriate, in not less than 50 mm (2 in.) red letters.

### **Additional Items on Fire Safety – Passenger Vessels**

**Cite: 46 CFR 76.10 – 10(a)**

On passenger and cargo ships of 1500 gross tons and over, the minimum hydrant and hose size for interior and exterior locations is 65 mm (2.5 in.).

**Cite: 46 CFR 78.47 - 13**

The fire detecting and manual alarm, automatic sprinkler, and smoke detecting alarm bells in the engine room shall be identified by at least 25 mm (1 in.) red lettering “FIRE ALARM”, “SPRINKLER ALARM”, or “SMOKE DETECTING ALARM” as appropriate.

**Cite: 46 CFR 78.47 - 17**

The control cabinets or spaces containing valves or manifolds for the various fire extinguishing systems shall be distinctly marked in conspicuous red letters at least 50 mm (2 in.) high “FOAM FIRE APPARATUS” or “AUTOMATIC SPRINKLING SYSTEM”, as the case may be.

### **Additional Items on Fire Safety – Cargo Vessels**

**Cite: 46 CFR 95.10 – 10(a)**

On passenger and cargo ships of 1500 gross tons and over, the minimum hydrant and hose size for interior and exterior locations is 65 mm (2.5 in.).

## **Additional Items covering 46 CFR Subchapter O – Bulk Dangerous Cargoes**

### **I. Bulk Liquid Chemicals – Specific Cargo Restrictions**

There are a small number of cargoes with additional U.S. requirements that exceed the IMO Chemical Codes.

- a. The following high vapor pressure cargoes (vapor pressure > 100 kPa at 37.8° C) may be carried if they are listed on the IMO COF and the vessel carries onboard a statement from the flag administration or classification society that the requirements of 46 CFR 153.370, 153.371 and 153.438 are met. If the tanks carrying these cargoes are not refrigerated, the tanks must be designed for no less than the relief valve settings shown (these are approximate cargo vapor pressures at 46° C or 115° F):
  1. Ammonium sulfide solution (46 % or less) (vapor pressure at 46° C for the particular mixture)
  2. Diethyl Ether (57 kPa gauge, 8.3 psig, 0.57 bar gauge)
  3. Dimethylamine, aqueous (greater than 55 % but less than 65 %) (vapor pressure at 46° C for the particular mixture)
  4. Ethylamine Solution (72 % or less) (vapor pressure at 46° C for the particular mixture)
  5. Isoprene (57 kPa gauge, 8.3 psig, 0.57 bar gauge)
  6. Isopropylamine (58 kPa gauge, 8.4 psig, 0.58 bar gauge)
  7. Methyl Formate (66 kPa gauge, 9.6 psig, 0.66 bar gauge)
  8. Propylene Oxide (49 kPa gauge, 7.1 psig, 0.49 bar gauge)
  9. Sodium Hydrosulfide Ammonium Sulfide Solution (vapor pressure at 46° C for the particular mixture)
  10. Vinyl Ethyl Ether (42 kPa gauge, 6.1 psig, 0.42 bar gauge)
  11. Vinylidene Chloride (64 kPa gauge, 9.3 psig, 0.64 bar gauge)
- b. Alkylene oxides (propylene oxide; ethylene oxide/propylene oxide mixtures (maximum of 30 % ethylene oxide); and 1,2-butylene oxide) may be carried if they are:
  1. listed on the IMO COF; and
  2. the vessel carries on board a statement from the classification society or flag state that the cargo piping is separated as specified by paragraph 4.7.17 of the IMO BCH Code (paragraph 15.8.25.3 of the IBC Code) and that the vessel meets 46 CFR 153.530(b), (d) and (p)(1).

### **II. Ships Carrying Liquefied Gases**

#### **1. Allowable Stress Levels for Independent Tank Types A and B**

The stress factors for use in designing independent Type B tanks are shown in Table 2. Stress factors A and B also apply when designing Type C tanks. Certification of this item should be indicated in the Certificate of Fitness. (For a vessel to be accepted as Type II PG, the minimum design MARVS of 686 kPa (7 kp/cm<sup>2</sup>) must be based on these stress factors).



**Table 2 - Values of Stress Factors**

Stress factors	Nickel steel and carbon manganese steel values	Austenitic steel values	Aluminum alloy values
A	4.0	4.0	4.0
B	2.0	1.6	1.5
C	3.0	3.0	3.0
D	1.5	1.5	1.5

## **2. Crack Arresting Steels**

The following grades of steel, or their equivalents, must be used along the length of the cargo area in the following locations as required by Section 154.70:

deck stringer:	Grade E
sheer strake:	Grade E
turn of the bilge:	Grade D or E

Certification of this item may be made in the Certificate of Fitness or on a separate certificate issued by the classification society or administration.

## **3. Design Ambient Temperatures**

Lower ambient temperatures for calculation of hull steel (see 154.174, 154.176, 154.466):

For Continental U.S. and Hawaii:

air (at 5 knots)	- 18 degrees C (0 degrees F)
seawater	0 degrees C (32 degrees F)

For Alaska:

air (at 5 knots)	- 29 degrees C (- 20 degrees F)
seawater	- 2 degrees C (28 degrees F)

Certification of this item should be indicated on the Certificate of Fitness.

(For gas ships with independent tanks Type C, it is sufficient to use the design ambient temperatures from the IMO Gas Carrier Code and International Gas Carrier Code).

## **4. Cargo Pressure/Temperature Control**

Except for the carriage of methane, the cargo containment system must be designed to maintain the cargo indefinitely without venting to the atmosphere at the upper design ambients of 45 degrees C for air and 32 degrees C for seawater. For methane, the cargo containment system must be designed to maintain the cargo without venting to the atmosphere for a minimum period of 21 days while a vessel is in port and under ambient

conditions of 45 degrees C for air and 32 degrees C for seawater. Certification of this item may be handled in the same manner as for item 2.

### **2.3.5 U.S. Interpretations Related to the SOLAS Cargo Ship Safety Construction Certificate**

#### **Chapter II - 1 --- Construction - Subdivision and Stability, Machinery and Electrical Installations**

##### **PART B - SUBDIVISION AND STABILITY**

##### **Regulation 11.2**

For collision bulkheads located at a distance of less than 5 % or more than 8 % of the length of the ship from the forward perpendicular, approval by the Commandant is to be obtained.

##### **Regulation 22.4**

DNV rules require a lightweight survey if an inclining test is dispensed with.

##### **Regulation 22.5**

DNV rules require a lightweight survey if an inclining test is dispensed with.

##### **PART D - ELECTRICAL INSTALLATIONS**

##### **Regulation 45 – 5.2**

Regulation 46 CFR 111.60 – 2 is to be used as guidance for any exemptions to the requirements of flame-retardant cables when used in special applications.

##### **Regulation 45 – 6.1**

If the allowance of a circuit not to be protected against short-circuit is desired, approval must be obtained from the Commanding Officer, Marine Safety Center.

#### **Chapter II - 2 --- Fire Protection, Fire Detection and Fire Extinction**

##### **PART A - GENERAL**

##### **Regulation 3.10**

Given in Item 3.10 in Annex to IMO MSC/Circ. 847.

##### **Regulation 18.1.1 and 2**

Given in Annex to IMO MSC/Circ. 847.

##### **PART C - FIRE SAFETY MEASURES FOR CARGO SHIPS**

##### **Regulation 45**

Given in Item 45.1 in Annex to IMO MSC/Circ. 847.

**Regulation 45.1.3**

All public spaces having a deck area of over 28 m<sup>2</sup> shall have at least two exits. Where practicable, the exits shall give egress to different corridors, spaces or rooms to minimize the possibility of one incident blocking both means of escape.

**Regulation 45.1.5**

Given in Item 45.1.5 in Annex to IMO MSC/Circ. 847.

**2.4 International Oil Pollution Prevention (IOPP) Certificate**

There are no additional requirements.

**3. Issue of Certificates**

Details of the procedural arrangements are given in the DNV Survey Procedures Manual.

**4. Maintenance of Records**

Copies of all approved plans and documents, survey reports and associated records, together with copies of certificates issued in relation to the tonnage, load line, SOLAS and oil pollution prevention aspects of United States registered ships are to be forwarded to the DNV Regional Office in the United States.