

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### SOLAS - Safety Equipment

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#### 1. SUPPLEMENTAL REQUIREMENTS

The following supplemental requirements relevant to the issue of a Cargo Ship Safety Equipment Certificate are given using the appropriate Code of Federal Regulations (CFR) cite or SOLAS regulation number.

##### General

##### Equipment Approvals

For U.S. flag vessels, specific and type approvals for fire suppression equipment, structural fire protection materials and life-saving appliances are performed by the USCG as mandated by SOLAS 1974, generally through independent laboratory testing and inspection. Provisions within the 1996 USCG Authorization Act also allow the use of equipment approved by or on behalf of other governments under certain circumstances. In the case of life-saving appliances, there must be a reciprocal agreement in place before equipment approved by that country could be used on a U.S. vessel. ACP does not change the requirements to use USCG approved materials and equipment. Therefore, class society approvals cannot be used to fulfil the obligations of the USCG, as an Administration, where type approval is required by the regulations.

The USCG approves applicable "SOLAS" lifesaving equipment using the IMO LSA Code. For fire protection items, the USCG approves "SOLAS" materials using the IMO Fire Test Procedures Code and the IMO Fire Safety Systems Code.

When a Mutual Recognition Agreement (MRA) between the U.S. and the European Community comes into effect, it will address a limited number of items of fire protection, lifesaving, and navigation equipment. The MRA will make it possible for a manufacturer with a European Approval (MED/Wheelmark) to obtain USCG approval for certain equipment covered by the MRA. This will be accomplished by permitting the "Notified Bodies" responsible for issuing approvals in Europe to issue USCG approval. Likewise, the USCG will be able to issue the European Approval (MED/Wheelmark) for manufacturers having a USCG approval if the item is included within the scope of the MRA. It is important to note that this MRA does not change the requirement of using USCG approved equipment and materials on U.S. Flag vessels. It allows an alternative means for obtaining USCG approval. The European Marine Equipment

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Directive (MED) "Wheelmark" will not be accepted in lieu of USCG approval.

## 2. FIRE EQUIPMENT AND ARRANGEMENTS

USCG type-approved materials and equipment from both U.S. and foreign sources approved in accordance with the procedures contained in 46 CFR 159 will continue to be acceptable, and those items manufactured in a country with which the United States has a Mutual Recognition Agreement in force or the USCG has found to have an equivalent approval program will also be acceptable.

As mentioned above in the "General" section, the 1996 USCG Authorization Act allows the use of materials approved by or on behalf of other governments under certain circumstances. Because reciprocity is not required for structural fire protection materials, the USCG will accept structural fire protection materials that are approved by a foreign administration once the USCG has determined that a country's approval process is acceptable. There are two countries (Canada and Japan) that produce and approve structural fire protection materials that would be acceptable to the USCG. A key point is that the product must be manufactured in the country and approved by, or on behalf of, that country's administration. For example, a fire door manufactured in Korea and approved by Japan would not be acceptable.

As discussed above, the following structural fire protection materials approved by, or on behalf of, other governments (Canada and Japan) may be used in lieu of USCG type approved materials for ACP vessels:

Item	USCG Approval Category
Deck assembly	164.105
Primary deck covering	164.106
Structural insulation ("A" and "B" class)	164.107
Bulkhead panels ("B" class)	164.108
Non-combustible material	164.109
Structural ceiling	164.110
Draperies, curtains, & other suspended textiles	164.111
Interior finish	164.112

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Floor coverings	164.117
Fire doors ("A" and "B" class): limited to doors without windows or with total window area no more than 645 cm <sup>2</sup> in each door leaf. Approval limited to maximum door size tested. Doors must be used with a fire tested frame design.	164.136
Windows* (see note below)	164.137
Penetration seals (fire stops)	164.138
Dampers	164.139
Bedding components	164.142
Upholstered Furniture	164.144
Fire door control system	164.146

\*Note: the following table must be used to determine when the applicable hose stream and thermal radiation test are required for "A" and "B" class windows.

Window Dimension	Classification	Hose Stream Test Required?	Heat Flux Test Required?
≤645 cm <sup>2</sup>	A-Class	No	No
>645 cm <sup>2</sup>	A-Class	Yes	Yes
>645 cm <sup>2</sup>	A-0	Yes	No
≤645 cm <sup>2</sup>	B-15	No	No
> 645 cm <sup>2</sup>	B-15	No	Yes
Any dimension	B-0	No	No

#### Regulation : II-2/10.2.1.5

#### Fire pumps, fire mains, hydrants and hoses – Number and position of hydrants

At each fire hose valve there shall be marked in not less than 50 mm (2 in) red letters and figures : "FIRE STATION."

#### Regulation : II-2/10.2.3.1.1

#### Fire pumps, fire mains, hydrants and hoses – Fire hoses

Each section of fire hose shall be lined commercial fire hose that conforms to Underwriters' Laboratories, Inc. Standard 19 or Federal Specification ZZ-H-451E.

#### Regulation : II-2/10.2.3.2.1

#### Fire pumps, fire mains, hydrants and hoses – Fire hoses

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The minimum hydrant and hose size shall be 40 mm (1.5 in.). On tankships over 125 m (L.O.A.), the minimum hydrant and hose size for exterior locations is 65 mm (2.5 in.). On passenger and cargo ships over 1500 gross tons, the minimum hydrant and hose size for interior and exterior locations is 65 mm (2.5 in.). Where 65 mm (2.5 in.) hydrants and hose are required, two 40 mm (1.5 in.) outlets and hoses may be substituted; however, both of the outlets operating simultaneously are to be considered as a single outlet for the purpose of complying with the minimum number of jets criteria for fire pump capacity.

#### **Regulation : II-2/10.2.3.3**

##### **Fire pumps, fire mains, hydrants and hoses – Nozzles**

Nozzles must be approved equipment.

#### **Regulation : II-2/10.4.1.1.1 and FSS Code Ch. 5**

##### **Fixed gas fire-extinguishing systems – General**

Fixed gas fire extinguishing systems must be approved equipment.

#### **Regulation : FSS Code Ch. 5.2.2**

##### **Fixed gas fire-extinguishing systems – Carbon dioxide systems**

The fixed carbon dioxide system must comply with the manufacturer's approved Design, Installation, Operation and Maintenance Manual that meets this SOLAS regulation and the following supplemental requirements:

##### **Quantity, Pipe Sizes and Discharge Rate**

In dry cargo spaces, the number of kilograms of carbon dioxide required for each space shall be equal to the gross volume of the space in cubic meters divided by 1.873. The gross volume includes trunks extending from the space; however, tonnage openings may be considered sealed. Branch lines to various cargo holds and 'tween decks shall be sized as to ensure a uniform distribution over the space protected.

For CO<sub>2</sub> systems installed for enclosed ventilation systems of rotating electrical propulsion equipment, the number of kilograms of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 0.624 for systems having a volume of less than 57

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cubic metres, and divided by 0.749 for systems having a volume of 57 cubic metres or more.

The piping for the initial charge shall be sized as to ensure a uniform distribution over the space protected, and the discharge of the required amount shall be completed within 2 minutes.

For CO<sub>2</sub> systems installed for enclosed ventilation systems of rotating equipment, in addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25% concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

For machinery spaces, tanks, pumprooms, paint lockers and similar spaces, any fixed gas fire extinguishing system used to protect these spaces must comply with the requirements of SOLAS Regulation II-2/10.4.1.1.1.

For spaces specially suitable for vehicles, any fixed gas fire extinguishing system used to protect these spaces must comply with the requirements of SOLAS Regulation II-2/20.6.1.1.

#### Controls

If the same cylinders are used to protect more than one space, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If the cylinders are used to protect only one space, a normally closed stop valve shall be installed between the cylinders and the space except for systems for protection of machinery spaces, pumprooms, paint lockers and similar space which contain not more than 130 kilograms of carbon dioxide.

Distribution piping to dry cargo spaces shall be controlled from not more than two stations. 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. All control stations and the individual valves and controls shall be distinctly marked to indicate the compartments or parts of the vessel to which they lead.

Systems for protection of machinery spaces, pumprooms, paint lockers and similar spaces shall be actuated at each station by one control

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operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

Where provisions are made for the simultaneous release of a given 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.

Systems for machinery spaces, pumprooms and similar type spaces, which are of more than 130 kilograms of carbon dioxide shall be fitted with an approved delayed discharge so arranged that an approved audible alarm will be automatically sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 130 kilograms of carbon dioxide shall also have a similar delayed discharge, except for spaces which have a suitable horizontal escape. The alarm shall depend on no source of power other than the carbon dioxide. In systems where an alarm is required, the alarm shall be conspicuously and centrally located. Adjacent to all carbon dioxide extinguishing alarms there shall be conspicuously marked:

"WHEN ALARM SOUNDS VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

All distribution valves and controls shall be approved equipment. All controls shall be suitably protected.

On systems in which the CO<sub>2</sub> cylinders are not within the protected space the instructions shall also include a schematic diagram of the system and instructions detailing alternate methods of discharging the system should the manual release or stop valve fail to operate. Each control valve to a branch line shall be marked to indicate the space served.

If the space or enclosure containing the CO<sub>2</sub> supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass type box conspicuously located adjacent to the opening.

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#### Piping

The piping, valves and fittings shall have a bursting pressure of not less than 41 N/mm<sup>2</sup> (6000 psi). All piping, valves and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise. Installation test requirements are as follows:

Upon completion of the piping installation, and before the cylinders are connected, a pressure test in accordance with the manufacturer's Design, Installation, Operation, and Maintenance Manual shall be conducted. Only CO<sub>2</sub> or other inert gas shall be used for this test.

#### Carbon Dioxide Storage

All cylinders used for storing carbon dioxide must be fabricated, tested, and marked in accordance with 46 CFR 147.60 and 46 CFR 147.65

#### Discharge Outlets

Discharge outlets shall be listed or approved by an independent testing laboratory.

#### Enclosure Openings

In all spaces protected by a carbon dioxide system, except cargo spaces, stopping of the ventilating fans is to be automatically actuated upon operation of the carbon dioxide system. This will not be required where the carbon dioxide system is a secondary system in addition to another approved primary system protecting the space.

#### Pressure Relief

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.

#### Markings

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CO<sub>2</sub> fire smothering apparatus shall be marked "CO<sub>2</sub> FIRE APPARATUS" in not less than 50 mm (2 in) red letters.

#### **Regulation : II-2/10.3 Fire extinguishers**

Fire extinguishers must be type-approved equipment.

#### **Regulation : II-2/10.5 Fire-extinguishing arrangements in machinery spaces – Incinerator space**

An enclosed space containing an incinerator shall be considered a machinery space of category A and, therefore, shall be provided with a fixed fire extinguishing system.

#### Markings

CO<sub>2</sub> fire smothering apparatus shall be marked "CO<sub>2</sub> FIRE APPARATUS" in not less than 50 mm (2 in) red letters.

#### **Regulation : II-2/10.4.1.1.3 and FSS Code Ch. 7 Fixed pressure water-spraying fire-extinguishing systems in machinery spaces**

A fixed pressure water-spraying, fire extinguishing system is not acceptable by the USCG except for lamp lockers, paint lockers and pumprooms. Where installed in these spaces, it shall comply with Chapter 7 of the FSS Code, and the following:

#### Capacity and Arrangement

The spacing of the spray nozzles shall be on the basis of the spray pattern provided by the lowest pressure at any spray nozzle in the system. In no instance shall a system be designed for any spray nozzle to be operated at a pressure less than that for which it was approved. The maximum permissible height of the spray nozzle above the protected area shall not exceed that specified in its approval. Whenever there are obstructions to coverage by the spray patterns, additional spray nozzles shall be installed to provide full coverage.

If a fire pump is used to supply water to the water spray system it is to be sized to provide the quantity of water required for operation of the water



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spray system while simultaneously supplying the required water to the fire main system.

#### Controls

Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

#### Piping

All piping, valves and fittings shall meet the applicable requirements of LR's Classification Rules Part 5 Chapter 11 as modified by the requirements of this supplement.

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

All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

Drains, strainers and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

Threaded joints shall be metal to metal, with no thread compound used. Distribution piping shall be used for no other purpose.

All piping shall be thoroughly cleaned and flushed before installation of the water spray nozzles. Spray nozzles shall be of an approved type.

#### Markings

The control cabinets or spaces containing valves or manifolds shall be distinctly marked in conspicuous red letters at least 50 mm (2 in) high – "WATER SPRAY FIRE APPARATUS."

#### **Regulation : II-2/10.6 and FSS Code Ch. 8**

#### **Automatic sprinkler, fire detection and fire alarm systems**

Automatic sprinkler systems are also to comply with National Fire Protection Association (NFPA) Standard 13-1996. Where SOLAS Reg. II-

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2/12 and NFPA Std. 13 have similar requirements, the higher standard is to be satisfied. The following supplemental requirements apply:

The sprinkler heads, alarms, dry pipe valves, and actuating mechanisms shall be listed or approved by a recognized independent testing lab.

All wiring and electrical circuits and equipment shall meet the applicable requirements of LR's Classification Rules Part 6 Chapter 2 and this supplement.

All piping, valves, fittings, pressure tanks, etc. must meet the applicable requirements of LR's Classification Rules Part 5 Chapter 11 as modified by this supplement.

The fire detecting and manual alarm, automatic sprinkler, and smoke detection 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. Where such alarms on the bridge or in the fire control station do not form a part of an easily identifiable alarm cabinet, the bells shall be suitably identified as above.

The control cabinets or spaces containing valves or manifolds shall be distinctly marked in conspicuous red letters at least 50 mm (2 in) high "AUTOMATIC SPRINKLING SYSTEM."

#### **Regulation : II-2/7 and FSS Code Ch. 9 Fixed fire detection and fire alarm systems**

Fire protection systems must be approved equipment.

A conductor must not be used as a common return from more than one zone. Each connection box that has conductors for more than one zone must be watertight.

There must be at least two sources of power for the electrical equipment of each fire detecting and alarm system. The normal source must be the main power source. The other source must be the emergency power source or an automatically charged battery. Upon loss of power to the system from the normal source, the system must be automatically supplied from the other source.

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The capacity of each system's storage battery must be sufficient to supply the fire detecting and alarm system for a period of not less than one week without recharging. At the end of the one week discharge period, the battery potential must not be less than 80 percent of nominal potential under design load.

The capacity of each branch circuit providing power to a fire detection or alarm system must not be less than 125 percent of the maximum load.

Each fire detecting zone must not include spaces on more than one deck, except:

- (a) Adjacent and communicating spaces on different decks in the ends of the vessel having a combined ceiling area of not more than 279 m<sup>2</sup> (3000 square feet).
- (b) Isolated rooms or lockers in such spaces as mast houses, wheelhouse top, etc., which are easily communicable with the area of the fire-detecting circuit to which they are connected.
- (c) Systems with indicators for individual spaces.

The fire detecting zone must not contain more than 50 protected rooms or spaces.

The system must visually indicate the zone in which the alarm originated.

The detectors, the detecting cabinet and alarms must be of an approved type.

The fire detecting system must be used for no other purpose, except it may be incorporated with the manual alarm system.

A framed chart or diagram must be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the detecting zones and giving operating instructions.

#### **Regulation : FSS Code Ch. 9**

#### **Fixed fire detection and fire alarm systems – Installation requirements**

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A sufficient number of call points must be employed such that a person escaping from any space would find an alarm box convenient on the normal route of escape.

The manual alarm system must be used for no other purpose, except it may be incorporated with the fire detecting system.

Manual fire alarm boxes shall be clearly and permanently marked "IN CASE OF FIRE BREAK GLASS" in at least 12.5 mm (1/2 in) letters.

Detector spacing shall be in accordance with the manufacturer's recommendation. Detector spacing in spaces with ceilings greater than 3 m (10 ft) must be corrected in accordance with NFPA 72E.

#### **Regulation : II-2/10.10 Fireman's outfit**

Lockers or spaces where emergency equipment is stowed shall be marked: "EMERGENCY EQUIPMENT".

#### **Regulation : II-2/13 Miscellaneous items**

Small rooms or spaces having a secondary means of escape which is not obviously apparent shall have a suitable sign in red letters "EMERGENCY EXIT" directing attention to such escape.

#### **Regulation : II-2/13.3.3 Means of escape**

The doors giving access to either of the two required means of escape shall not be lockable, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided that a permanent and conspicuous notice giving instructions on how to open the door or the lock is attached to both sides of the door. This paragraph shall not apply to outside doors to deckhouses where such doors are locked by key only, and such key is under control of one of the vessel's officers.

All public spaces having a deck area of over 28 sq. metres 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.

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All interior stairways, other than those within the Machinery Spaces or Cargo Holds, shall have a minimum width of 0.71 metres. The angle of inclination with the horizontal of such stairways shall not exceed 0.87 radius.

#### **Regulation : II-2/10.8 and FSS Code Ch. 14 Fixed deck foam systems**

The system must be approved equipment and must comply with the manufacturer's approved Design, Installation, Operation and Maintenance Manual that meets this regulation and the following supplemental requirements:

Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

The deck foam system must be capable of being actuated, including introduction of foam to the foam main, within three minutes of notification of a fire.

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

All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

Piping shall not be used for any other purpose than firefighting, drills and testing.

At least one mounted foam appliance shall be provided for each required foam station.

Foam apparatus, 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".

### **3.3 LIFE-SAVING APPLIANCES AND ARRANGEMENTS**

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#### Regulation: III/3 Definitions

"Accommodation" means a cabin or other covered or enclosed place intended to carry persons. Each place where passengers are carried is considered an accommodation, whether or not it is covered or enclosed. Accommodations include, but are not limited to halls, dining rooms, mess rooms, lounges, corridors, lavatories, cabins, offices, hospitals, cinemas, game and hobby rooms, and other similar spaces open to persons on board. "Embarkation station" means the place where a survival craft is boarded.

"Embarkation station" means the place where a survival craft is boarded.

"Fleet angle for a wire rope leading to a winch drum" means the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum and the line formed by the wire rope when led from the lead sheave to either extremity of the drum.

"Marine evacuation system" means an appliance designed to rapidly transfer large numbers of persons from an embarkation station by means of a passage to a floating platform for subsequent embarkation into associated survival craft, or directly into associated survival craft.

"Muster station" means the place where the crew and passengers assemble before boarding a survival craft.

"Seagoing condition" means the operating condition of the ship with the personnel, equipment, fluids and ballast necessary for safe operation on the waters where the ship operates. For bottom-bearing mobile offshore drilling units, the term also applies in the bottom-bearing mode, but the "lightest seagoing condition" is considered to be the highest anticipated operating condition.

"Survival craft" means a craft capable of sustaining the lives of persons in distress after abandoning the ship on which they were carried. The term includes lifeboats, liferafts, buoyant apparatus, and life floats, but does not include rescue boats.

"Toxic vapor or gas" means a product for which emergency escape respiratory protection is required under subchapter 17 of the International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code), and in subchapter 19 of the International

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Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk (IGC Code).

#### **Regulation: III/4 Evaluation, testing and approval of life-saving appliances and arrangements**

Life-saving appliances must be approved to the appropriate CFR, SOLAS or IMO standard. USCG approved products and systems are accepted regardless of country of manufacture. The USCG recognizes that with the Life-saving Appliances Code (LSA Code) there exists an acceptable IMO standard for approval.

As mentioned above in the "General" section, the 1996 USCG Authorization Act allows the use of materials approved by or on behalf of other governments under certain limited circumstances. In the case of life-saving appliances, there must be a reciprocal agreement in place with another country before equipment approved by that country can be used on a U.S. vessel. Pending finalization of the US-EC MRA, interim reciprocal acceptance agreements have been established with Germany (free-fall lifeboats and associated launching appliances only) and Norway (all life-saving equipment). These agreements require that the equipment be manufactured within the country that approved it. A copy of the USCG acceptance letter must be provided with each piece of equipment supplied to a U.S. flag ship under these interim agreements.

The following approval series indicate approval to the SOLAS requirements:

- 160.017 Embarkation-Debarkation Ladders (only if marked "SOLAS 74/83")\*
- 160.040 Line-throwing appliances
- 160.115 Winches\*\*, if winches for Rescue Boats\*\*\*
- 160.117 Embarkation-Debarkation Ladders\*
- 160.118 Rigid liferafts\*\*\*
- 160.121 Hand red flares
- 160.122 Floating orange smoke signals
- 160.132 Davits\*\*, if davits for Rescue Boats\*\*\*
- 160.135 Lifeboats\*\*
- 160.136 Rocket parachute flares
- 160.150 Ring life buoys\*
- 160.151 Inflatable liferafts\*\*\*
- 160.155 Lifejackets
- 160.156 Rescue boats\*\*\*

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- 160.157 Self-activating smoke signals
- 160.162 Hydrostatic release units\*
- 160.163 Liferaft launching appliance
- 160.170 Liferaft automatic disengaging apparatus
- 160.171 Immersion suits
- 160.174 Thermal protective aids
- 160.175 Marine Evacuation Systems\*\*\*
- 160.176 Inflatable Lifejackets (SOLAS)
- 161.110 Floating electric water lights
- 161.112 Lifejacket lights

Those items without an asterisk (\*) are to be forwarded directly to the USCG for their approval.

\* indicates those items for which [LR] possesses USCG acceptance to conduct approval (design review and testing) work on behalf of the USCG.

\*\* indicates items which come under the U.S. District Court Order of 31 May 1983, which declares invalid any inspection or test not conducted by or in the presence of a USCG Marine Inspector. The Order does not address pre-approved reviews. This Order remains in effect until such time as the USCG publishes a final regulation in the Federal Register removing the requirement for a USCG Marine Inspector to witness the inspections or test.

\*\*\* indicates that the USCG reserves the right to attend prototype testing of this equipment as a condition of approval. This option will normally be exercised in the case of a manufacturer seeking approval of this equipment for the first time, or for a substantially new or innovative design.

Where a particular life-saving appliance or arrangement is required, the Commandant, USCG, may accept any other appliance or arrangement that is at least as effective as that specified. If necessary, the Commandant, USCG, may require engineering evaluations and tests to demonstrate the equivalence of the substitute appliance or arrangement.

Life-saving appliances carried on board the ship in addition to equipment of the type required under this part must be approved equipment or be acceptable to the cognizant USCG Officer in Charge of Marine Inspection (OCMI) for use on the ship.



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#### **Regulation: III/6 Communications**

Each item of radio communications equipment must be type accepted by the Federal Communications Commission.

#### **Regulation: III/7 and LSA Code Ch. 2 Personal life-saving appliances**

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

Each lifejacket and immersion suit must be marked with the vessel's name.

Inflatable lifejackets, if carried, must all be of the same or similar design.

Each lifejacket, immersion suit, and anti-exposure suit container must be marked in block capital letters and numbers with the quantity, identity, and size of the equipment stowed inside the container. The equipment may be identified in words or with the appropriate symbol from IMO Resolution A.760(18).

#### **Regulation: III/8 Muster list and emergency instructions**

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

#### **Regulation: III/11 Survival craft muster and embarkation arrangements**

If a davit-launched survival craft is not intended to be moved to the stowed position with persons on board, the craft must be provided with a means for bringing it against the side of the vessel and holding it alongside the vessel to allow persons to safely disembark after a drill.

#### **Regulation: III/13 Stowage of survival craft**

Each liferaft must be arranged to permit it to drop into the water from the deck on which it is stowed. The liferaft stowage arrangement meets this requirement if it:

- (i) is outboard of the rail or bulwark,
- (ii) is on stanchions or on a platform adjacent to the rail or bulwark, or

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- (iii) has a gate or other suitable opening large enough to allow the liferaft to be pushed directly overboard and, if the liferaft is intended to be available for use on either side of the vessel, such gate or opening is provided on each side of the vessel.

#### **Regulation: III/18 and LSA Code Ch. 7 Line-throwing appliances**

In addition to the equipment approved and carried as part of the appliance, each line throwing appliance must also have an auxiliary line that:

- (1) if other than manila, has a breaking strength of at least 40 kN (9,000 lb);
- (2) if other than manila, is of a dark color or of a type certified to be resistant to deterioration from ultraviolet light; and
- (3) is at least 450 m (1,500 ft) long.

The line throwing appliance and its equipment must be readily accessible for use, stowed in its container carried within the pilothouse or on the navigating bridge or stowed in a portable magazine chest.

#### **Regulation: III/32.3 and LSA Code Ch. 2 Personal life-saving appliances – Immersion suits and thermal protective aids (cargo ships)**

Immersion suits must be carried for each person on board on all cargo vessels except those operating between 32 degrees north and 32 degrees south latitude, regardless of whether it has totally enclosed lifeboats.

#### **Regulation: III/33 Survival craft embarkation and launching arrangements**

On a tank vessel certificated to carry cargoes that have a flashpoint less than 60 degrees C as determined under ASTM D93-94, each lifeboat or launching appliance of aluminum construction must be protected by a water spray system.

#### **Regulation III/34 and LSA Code 6.1.2.9 Launching appliance using falls and a winch**

The lowering speed for a fully loaded survival craft must be not more than 1.3 metres per second (256 feet per minute).

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### SOLAS - Safety Equipment

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#### **Regulation III/34 and LSA Code 6.1.2 Launching appliances using falls and a winch**

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 (1 foot) above the deck. Each winch drum must be arranged so the fall wire winds onto the drum in a level wrap.

#### **Regulation: IV/7.1.6 Radiocommunications – Application**

The required EPIRB must be marked with the vessel's name.

#### **Regulation: V/22 Navigation Bridge Visibility**

In addition to the SOLAS implementation schedule, this regulation applies to all cargo and passenger vessels of 100m or more in length and contracted for construction on or after 7 September 1990.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Dangerous Chemicals in Bulk (IBC Code)

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#### 6. INTERPRETATIONS AND GUIDANCE RELATING TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (IBC CODE)

##### 6.1 General

Unless otherwise noted below, LR is authorised to interpret the expressions "*left to the satisfaction of the Administration,*" or similar expressions in the IBC Code pertaining to the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.

##### 6.2 Interpretations and Guidance

###### Chapter 1

1.1.3 USCG will handle matters relating to carriage conditions of cargoes not listed in the IBC Code.

1.3.13 The approved closed cup test uses the Tagliabue tester.

1.4 Generally, USCG acts as the administration for findings of equivalency.

1.5 Under this section, the Administration means the USCG.

1.5.4.1 The Certificate of Fitness issued by LR on behalf of the USCG will not include an asterisk against the ship type notation.

1.5.4.2 Chapter 2 — Ship survival capability and location of cargo tanks

2.2.2 Intact stability shall meet requirements for gas carriers contained in 46 CFR 172.165, viz:

(a) Design calculations must show that 2 inches (50 mm) of positive metacentric height can be maintained by each tankship when it is being loaded and unloaded.

(b) For the purpose of demonstrating compliance with the requirements of paragraph (a) of this section, the effects of the addition of water ballast may be considered.

2.2.3 An acceptable method for determining free surface effect is contained in the Code on Intact Stability (IMO Res. A.749(18) as amended).

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Dangerous Chemicals in Bulk (IBC Code)

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- 2.3.3 The valve shall be to LR's rules.
- 2.8.2 No dispensations for smaller ships will be allowed.
- 2.9.2.3 Residual stability should not be less than that allowed in 2.9.3.

#### Chapter 3 — Ship arrangements

- 3.4.4 Smaller dimensions are not permitted unless authorised by the USCG.  
Acceptable openings must permit entry with breathing apparatus.
- 3.7.2 Toxic cargoes cannot be unloaded *bow* or stern unless authorised by the USCG.
- 3.7.3.5 Alternative arrangements must be authorised by USCG.
- 3.7.4 USCG must authorise relaxations.

#### Chapter 4 — Cargo Containment

- 4.1.3 LR's rules apply for tank testing.
- 4.1.4 ASME Code Section VIII, Division 1 or 2, applies for pressure vessel design.

#### Chapter 5 — Cargo transfer

- 5.1.1 Piping standards are listed in 46 CFR 56.60.
- 5.1.3 Flanges valves and fittings should meet applicable standards of the ASME.
- 5.2.1 Relaxation's must be authorised by the USCG.
- 5.2.2 Exceptional cases should be authorised by the USCG.
- 5.2.3 Piping standards are listed in 46 CFR 56.60.
- 5.2.4 Piping standards are listed in 46 CFR 56.60.
- 5.2.4 Piping standards are listed in 46 CFR 56.60.
- 5.4 Relaxation's must be authorised by USCG.

#### Chapter 6 — Materials of construction

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Dangerous Chemicals in Bulk (IBC Code)

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6.1.1 Materials must meet LR's rules.

#### **Chapter 7 — Cargo temperature control**

7.1.1 Construction, fitting and testing must comply with LR's rules.

#### **Chapter 8 — Cargo tank vent systems**

8.3.4 High velocity vents must be approved in accordance with 46 CFR Subchapter Q.

8.3.5 Flame arresters installed on tanks should meet ASTM F-1273.

#### **Chapter 10 — Electrical installations**

10.1.5 The International Electrotechnical Commission Standard IEC 60092-502 shall be the standard of hazardous areas.

10.2.2.1 No electric motors should be installed in chemical tanks.

10.2.3.4.2 Electric motors are not permitted in the cargo area.

#### **Chapter 11 — Fire protection and fire extinction**

11.2.2 Tankers carrying a restricted number of cargoes should not receive relaxation's.

11.3.2 More than one type of foam should be provided when fires of cargoes cannot be extinguished using only one foam.

11.3.7 Reduced monitor capacities for ships less than 4,000 DWT should be referred to USCG.

#### **Chapter 12 — Mechanical ventilation in the cargo area**

n/a No special requirements.

#### **Chapter 13 — Instrumentation**

13.2.3 Exemptions from toxic-vapour detection are only to be authorised by USCG.

#### **Chapter 14 — Personnel protection**

14.1.2 Interpretation of the expression "*adequately segregated*" is left to LR, subject to USCG oversight.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Dangerous Chemicals in Bulk (IBC Code)

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#### Chapter 15 — Special Requirements

- 15.2.3 USCG only authorises carriage of ammonium nitrate (93% or less) in tanks which have not contained other cargoes.
- 15.5 Cooling systems, when fitted, should also be provided with leak detection systems.
- 15.6.3 USCG only authorises entry into tanks that have not contained MFAK compounds.
- 15.7 USCG only authorises carriage of molten phosphorous.
- 15.8.11 The materials listed are not acceptable under any circumstances.
- 15.8.22.2 The refrigeration requirements may not be waived.
- 15.8.25.2 Cargo handling plans are left to LR, subject to USCG oversight.
- 15.8.26.3 Cargo tank filling limits are left to LR, subject to USCG oversight.
- 15.8.29 The waterspray shall operate automatically in a fire involving the cargo containment system, have at least two manual actuators, and have an application rate of 10.5 l/m<sup>2</sup> / min.
- 15.12.1.4 High velocity vents must be approved in accordance with 46 CFR Subchapter Q.
- 15.14.3 No waivers will be granted for restricted operations.
- 15.19.7 LR acts as the Administration.

#### Chapter 16 — Operational Requirements

- 16.2.2 USCG will review all cargoes which are mixtures.
- 16.5.1 Samples must be stored in the cargo area.

#### Chapter 16A — Additional measures for the protection of the marine environment

- n/a No special interpretations.

#### Chapter 17 — Summary of minimum requirements

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Dangerous Chemicals in Bulk (IBC Code)

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n/a No special interpretations.

#### **Chapter 18 — List of chemicals to which the code does not apply**

n/a No special interpretations.

#### **Chapter 19 — Requirements for ships engaged in the incineration at sea of liquid chemical waste**

The provisions of this section do not apply. No vessels will be certified for incineration at sea.

#### **Chapter 20 — Transportation of Liquid Chemical Wastes.**

Transportation of liquid chemical wastes, although not generally permitted, requires USCG authorisation in concert with the US EPA.



## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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## 7. INTERPRETATIONS AND GUIDANCE RELATING TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (IGC CODE)

### 7.1 General

Unless otherwise noted below, LR is authorised to interpret the expressions "*left to the satisfaction of the Administration,*" or similar expressions in the IGC Code pertaining to the International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk.

Carriage of Chlorine is not permitted without the prior agreement of USCG.

### 7.2 Interpretations and Guidance

#### Chapter 1

1.1.6 USCG acts only as a port administration for this requirement.

1.4 USCG acts as the Administration for this section.

1.5 USCG acts as the Administration for this section.

1.5.4.2 The Certificate of Fitness issued by LR on behalf of the USCG will not include an asterisk against the ship type notation.

#### Chapter 2 — Ship survival capability and location of cargo tanks

2.2.2 Intact stability shall meet requirements for gas carriers contained in 46 CFR 172.165, viz:

(a) Design calculations must show that 2 inches (50 mm) of positive metacentric height can be maintained by each tankship when it is being loaded and unloaded.

(b) For the purpose of demonstrating compliance with the requirements of paragraph (a) of this section, the effects of the addition of water ballast may be considered.

2.2.3 An acceptable method for determining free surface effect is contained in the Code on Intact Stability (IMO Res. A.749(18) as amended).

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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- 2.9.1.3 Residual stability should not be less than the requirement in 2.9.2.1.

#### Chapter 3 — Ship arrangements

- 3.1.1 Machinery spaces forward of the cargo area are not normally permitted.
- 3.3.1.1 Relaxation of the pump or compressor room location requirement is not permitted.
- 3.5.3.2 Relaxation of the access dimensions are not is not permitted.
- 3.8.1.1 Bow and stern unloading is not permitted for toxic products.
- 3.8.4 Relaxation of this section's requirements is not permitted.

#### Chapter 4 — Cargo Containment

- 4.1 Cargo containment systems not previously accepted by the USCG will require USCG review and approval. A list of cargo containment systems currently accepted by the USCG may be obtained from Commandant (G-MSO-3).
- 4.2.2.3 See note concerning 4.1.
- 4.2.4.2 Recognised standards are LR's rules.
- 4.2.4.4 Type C tanks may be allocated only to Type B.
- 4.2.5.4 Internal insulation tanks shall not have a design vapour pressure greater than 0.7 bar.
- 4.2.6.4 Higher vapour pressures in port are not allowed.
- 4.2.7 Provisions to cover low temperature prevention are covered in Chapter 13.
- 4.3.2.1 Equivalent calculation procedures must be submitted to USCG.
- 4.3.4.3 Simplified loading spectra shall not be used.
- 4.3.4.5 No special consideration shall be given for restricted service.
- 4.4.1 Integral tanks must meet LR's rules.
- 4.4.2.5 ShipRight shall be used for structural analysis, and LR's rules will be used for recognised standards.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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- 4.4.4.1 LR's rules will be used for recognised standards.
- 4.4.4.2 LR's rules will be used for recognised standards.
- 4.4.5.5 Model tests will normally be required.
- 4.5.1.4 The value of A shall be 4.0 for all materials.
- 4.4.6 ASME Boiler and Pressure vessel Code will be used as the acceptable standard, except as required otherwise.
- 4.4.7.2.1 ShipRight will be used for structural analysis.
- 4.4.7.2.3 LR's rules are the recognised standards.
- 4.4.7.3 See note on 4.1.
- 4.5.1.1 LR's rules are recognised standards.
- 4.5.1.3 Acceptable stresses are those which agree with LR's rules.
- 4.5.1.7.2 Special consideration of improved tensile and yield properties must be demonstrated to the USCG.
- 4.5.1.10 Unspecified materials must be reviewed by USCG.
- 4.5.2.1 Corrosion allowances will be required for tanks that are not surrounded by inert gas or dry air or for corrosive cargoes. The USCG will provide the values for these allowances upon request.
- 4.7.3 Semi-membrane tanks shall have a full secondary barrier.
- 4.7.7 Either a pressure/vacuum test or a visual test shall be specified.
- 4.8.1 For vessels that intend to trade to Alaska, lower ambients are required. U.S. ambients are as listed in 46 CFR 154.176.
- 4.8.4.4 In general, hull heating systems are not acceptable.
- 4.9.1 Recognised standards are LR's rules, but vessels should have crack arresting steels specified by USCG.
- 4.9.8 Quality control of insulation is delegated, subject to USCG oversight.
- 4.10.1.2.1 Alternative edge penetrations are generally not permitted.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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- 4.10.1.2.2 The ASME Code is the acceptable standard; other standards require USCG approval.
  - 4.4.10.2 USCG should be contacted concerning workmanship. In general, tolerances shall be half of the ASME Code.
  - 4.10.5.2 Sampling tests shall be according to LR's rules.
  - 4.10.6 Testing should be in accordance with LR's rules for type A tanks, USCG requirements for type B tanks, and ASME Code requirements for type C tanks.
  - 4.10.8.1 Recognised standards are LR's rules.
  - 4.10.8.2 Recognised standards are LR's rules.
  - 4.10.8.3 LR's tank testing rules are satisfactory to USCG.
  - 4.10.9 ASME code is the standard acceptable.
  - 4.10.10.3.4 Hydropneumatic testing is not acceptable.
  - 4.10.10.3.5 Higher stresses are not acceptable.
  - 4.10.12 See Note concerning 4.7.7.
  - 4.10.13 Tanks constructed to the ASME Code do not need stress level confirmation.
  - 4.11.1.4 Soaking should be according to the ASME Code.
  - 4.11.2 Stress relief shall comply with the ASME Code.
  - 4.11.2.14 Mechanical stress relief methods must be approved beforehand by USCG.
- Chapter 5 — Process pressure vessels and liquid, vapour, and pressure piping systems**
- 5.1.2 Process pressure vessels shall meet the ASME Code.
  - 5.2.2.1 Piping standards shall be as required by 46 CFR Subchapter F.
  - 5.3.2.1 No higher or lower temperature may be specified.
  - 5.3.2.2 No higher or lower temperature may be specified.
  - 5.2.4.4 No lower design pressure may be accepted.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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- 5.2.4.5 Flanges must comply with ASME B16.5.
- 5.2.5 Stress analysis is delegated to LR, subject to oversight by USCG.
- 5.3.2.2.2 In general, pressure tests need not be performed at the design temperature.
- 5.3.2.2.5 Performance of tests may not be waived.
- 5.4.2.3 Piping standards shall be as required by 46 CFR Subchapter F.
- 5.4.3.2 Flanges must comply with ASME B16.5.
- 5.4.4 Alternative piping arrangements require USCG approval.
- 5.4.6.2 Thermal stress relieving may not be waived.
- 5.4.6.3.1 Radiography may not be reduced.
- 5.5.1 No relaxation's are permitted.
- 5.5.2 Alternative fluids must be liquids that have a flashpoint greater than 125°F.

### Chapter 6 — Materials of construction

- 6.1.3 Recognised standards are LR's rules.
- 6.1.4.1 A Charpy V-Notch test is required.
- 6.1.4.2 Other tests may not be substituted for the Charpy V-Notch test.
- 6.1.5 Material properties must meet LR's rules.
- 6.1.7 Alternative chemical properties are not acceptable.
- Table 6.1 (footnotes) No special approval is permitted.
- Table 6.2 (footnotes) No special agreement or approval is permitted.
- Table 6.3 (footnotes) No special approval is permitted.  
Generally, Charpy testing should be required.
- Table 6.4 (footnotes) No special approval is permitted.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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Generally, Charpy Testing should be required.

6.3.1 Testing may not be omitted.

Generally, Charpy testing should be required.

6.3.2 Welding consumables shall meet LR's rules for type A tanks, USCG specifications for type B tanks, and ASME Code requirements for type C tanks. Welding tests may not be waived.

6.3.3.1 Radiography is required.

6.3.3.2.2 Transverse bend tests are at the discretion of LR.

6.3.3.2.4 Requirements for these test are left to the discretion of LR.

6.3.4.2 No special agreement is permitted.

6.3.4.3 Recognised standards for this section will be individually reviewed.

6.3.5 Test requirements should be in accordance with 6.3.4.

6.3.6.1 A reduction in test for secondary barrier is not acceptable.

6.3.6.2.2 USCG will consider alternatives to the energy requirements on a case by case basis.

6.3.6.3 USCG will consider alternatives to the energy requirements on a case by case basis.

6.3.6.4 Integral and membrane tests must be inspected according to USCG approved standards available from the manufacturer.

6.3.7.1.2 Tank examination will be as approved by USCG for the tank designed.

6.3.7.1.3 LR's rules shall be the recognised standards, except that for membrane tanks the USCG accepted manufacturer's procedures shall be used.

6.3.7.3 See Note for 6.3.7.1.3.

### Chapter 7 — Cargo pressure/Temperature Control

7.1.1 Design of cargo pressure and temperature control must contain cargo for 21 days, and cargo venting cannot be used to control tank pressure while in US ports.

## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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- 7.1.2 Special design ambient temperatures apply for Alaskan waters, as given in 46 CFR 154.176.

#### Chapter 8 — Cargo tank vent systems

- 8.2.2 Pressure/vacuum relief is delegated to LR, subject to USCG oversight.
- 8.2.5 LR is the acceptable authority.
- 8.2.7 Changing of relief valve settings will be overseen by an agent of LR.
- 8.2.10 No relaxation of this requirement is accepted for ships less than 90 m.
- 8.4.2.3 Other vacuum relief systems must be handled under the conditions of 1.4.
- 8.5.2 Approval for F=0.5 is delegated to LR, subject to USCG oversight.

#### Chapter 9 — Environmental control

- 9.5.2 A check valve is an acceptable means.

#### Chapter 10 — Electrical installations

The International Electrotechnical Commission Standard IEC 60092-502 shall be applied.

#### Chapter 11 — Fire protection and fire extinction

- 11.3.4 When the fire main pumps are used to supply the water main system, the fire main must still be able to operate at full capacity.
- 11.4.3 LR is delegated to accept standards for ships with a capacity less than 1,000 m<sup>3</sup>.
- 11.4.4 Suitable alternatives will be considered according to 1.4.
- 11.5.2 Relaxation's are not permitted for ships carrying a restricted number of cargoes.

#### Chapter 12 — Mechanical ventilation in the cargo area

- 12.1.5 Positive pressure ventilation is not acceptable.

**Liquefied Gas Carriers (IGC Code)**

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**Chapter 13 — Instrumentation (gauging, gas detection)**

- 13.1.4 Testing intervals and procedures are delegated to LR, subject to USCG oversight. Vessels in US ports should be able to demonstrate that the instruments function, and in the case of gas detection that they are properly calibrated.
- 13.2.4 Gauge glasses need USCG approval, but are generally not acceptable.
- 13.3.1 USCG should be contacted in the case that it is the port authority.
- Sensors required for automatic closing of the shut-off valve for overflow controls as specified by 13.3.1 and the liquid level as specified by 13.2.1, must be independent of each other, however, the sensors may send signals to the same actuator.
- 13.5.4 Temperature sensors should be at the bottom of the tank and near the top of the tank, below the maximum filling level.
- 13.6.1 Gas detection is delegated to LR, subject to USCG oversight.
- 13.6.11 Other limits are not acceptable.
- 13.6.13 Portable gas detectors should meet the thresholds specified by OSHA.

**Chapter 14 — Personnel protection**

- 14.2.4 The provisions of this paragraph are not acceptable.
- 14.4.5 This requirement is delegated to LR, subject to USCG oversight.

**Chapter 15 — Filling limits for cargo tanks**

- 15.1.3 Higher filling limits are permitted.
- 15.2 The approval of this list is delegated without restriction.

**Chapter 16 — Use of cargo as fuel**

- 16.5.2 This requirement is delegated to LR, subject to USCG oversight.



## U.S. SUPPLEMENT TO LR'S CLASSIFICATION RULES

### Liquefied Gas Carriers (IGC Code)

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- 16.5.6 This requirement is delegated to LR, subject to USCG oversight.
- 16.6 This requirement is delegated to LR, subject to USCG oversight.

#### **Chapter 17 — Special Requirements**

- 17.14 Chlorine may not be carried in US waters.
- 17.18.3 Other compositions require USCG approval.
- 17.19 Nitrogen cargo carriage requires special USCG approval.
- 17.20.3.1 Only steel or stainless steel are acceptable.
- 17.20.13.2 The approval of handling plans is delegated to LR.
- 17.20.14 The approval of filling limits is delegated to LR.

#### **Chapter 18 — Operating requirements**

No special requirements.

#### **Chapter 19 — Summary of minimum requirements**

No special requirements.