

Amendments of the Rules

(External Opinion Inquiry)

Pt. 8 Fire Protection and Fire Extinction



2020. 09.

Hull Rule Development Team

– Main Amendments –

(1) Effective Date : 1 July 2020(based on contract date for construction)

● Reflection of IMO Resolution MSC.421(98).

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p style="text-align: center;">Section 1 General</p> <p>101. ~ 102. <omitted></p> <p>103. Definitions</p> <p>1. ~ 55. <omitted></p> <p>56. Vehicle carrier means a cargo ship <u>with multi deck ro-ro spaces designed for the carriage of empty cars and trucks as cargo.</u></p> <p>57. ~ 58. <omitted></p> <p><newly added></p>	<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p style="text-align: center;">Section 1 General</p> <p>101. ~ 102. <same as the present></p> <p>103. Definitions</p> <p>1. ~ 55. <same as the present></p> <p>56. Vehicle carrier means a cargo ship <u>which only carries cargo in ro-ro spaces or vehicle spaces, and which is designed for the carriage of unoccupied motor vehicles without cargo, as cargo.</u></p> <p>57. ~ 58. <same as the present></p> <p>59. Winching area is a <u>pick-up area provided for the transfer by helicopter of personnel or stores to or from the ship, while the helicopter hovers above the deck.</u></p>	<p>-Reflection of Res. MSC.421(98)</p>

Amendments of the Guidance relating to the Rules

(External Opinion Inquiry)

Pt. 8 Fire Protection and Fire Extinction



2020. 12.

Rule Development Team

– Main Amendments –

(1) Effective Date : 1 January 2021(based on contract date for construction)

- Reflection of IACS UR F7(Rev.3 June 2020).
- Reflection of internal request for rule revision(exhaust ducts from galley ranges)
- Development of the additional requirements relating to fire protection and fire extinction of cargo ship

Present	Amendment	Not~
<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application [See Rule]</p> <p>1. ~ 3. <omitted></p> <p>4. <newly added></p> <p>102. <omitted></p> <p style="text-align: center;">CHAPTER 2 PROBABILITY OF IGNITION</p> <p style="text-align: center;">Section 1 Arrangements for Oil Fuel, Lubrication Oil and Other Flammable Oils</p> <p>101. <omitted></p> <p>102. Arrangements for oil fuel</p> <p>1. ~ 10. <omitted></p> <p>11. <omitted></p> <p>(1)~ (2) <omitted></p> <p>(3) Components attached to machinery which satisfy fire test criteria according to <u>standard ISO 19921:2005/19922:2005 or other standards acceptable to the Administration</u>, and which retain mechanical properties adequate for the intended installation.</p>	<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application [See Rule]</p> <p>1. ~ 3. <omitted></p> <p>4. <u>In addition to the requirements of the Rules, cargo ships wishing to be assigned an AFP(Additional Fire Protection and Fire Extinction) notation as an additional special feature are also to comply with the requirements of Annex 8-9.</u></p> <p>102. <omitted></p> <p style="text-align: center;">CHAPTER 2 PROBABILITY OF IGNITION</p> <p style="text-align: center;">Section 1 Arrangements for Oil Fuel, Lubrication Oil and Other Flammable Oils</p> <p>101. <omitted></p> <p>102. Arrangements for oil fuel</p> <p>1. ~ 10. <omitted></p> <p>11. <newly added></p> <p>(1)~ (2) <omitted></p> <p>(3) Components attached to machinery which satisfy fire test criteria according to <u>standard ISO 19921/19922 or other standards acceptable to the Society</u>, and which retain mechanical properties adequate for the intended installation.</p>	

Present	Amendment	Note
<p style="text-align: center;">Section 4 Cargo Areas of Tankers</p> <p>401. ~ 406. <omitted></p> <p>407. Gas measurement and detection</p> <p style="padding-left: 20px;">1. ~ 2. <omitted></p> <p style="padding-left: 20px;"><newly added></p> <p style="padding-left: 20px;"><u>3.</u> ~ <u>5.</u> <omitted></p> <p>410. <omitted></p>	<p style="text-align: center;">Section 4 Cargo Areas of Tankers</p> <p>401. ~ 406. <same as the present></p> <p>407. Gas measurement and detection</p> <p style="padding-left: 20px;">1. ~ 2. <omitted></p> <p style="padding-left: 20px;"><u>3.</u> For tankers fitted with inert gas systems in 407. 1 of the Rules, at least two portable gas detectors are to be capable of measuring concentrations of flammable vapours in inerted atmosphere (% gas by volume).</p> <p style="padding-left: 20px;"><u>4.</u> ~ <u>6.</u> <omitted></p> <p>410. <same as the present></p>	<p style="text-align: center;">-Reflection of Res. MSC.421(98)</p>

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 7 CONTAINMENT OF FIRE</p> <p style="text-align: center;">Section 1 ~ Section 5 <omitted></p> <p style="text-align: center;">Section 6 Ventilation Systems</p> <p>601. ~ 603. <omitted></p> <p>605. Exhaust ducts from galley ranges <i>(2017)</i></p> <p>1. The exhaust ducts from galley ranges are to be in accordance with the following requirements:</p> <p>(1) ~ (2) <omitted></p> <p>(3) <u>In case where the carbon dioxide gas fire extinguishing system specified in 403. of the Rules is provided as fixed means for extinguishing a fire within the exhaust duct, the quantity of fire extinguishing medium is to be 100% or more of the volume of the duct spaces to be protected.</u></p> <p>(4) With respect to fixed means for extinguishing a fire specified in 1 (3) & 3 (4) of the rules, <u>reference is to be made to ISO 15371:2009. The reference to ISO 15371:2009 is given as an example of a suitable performance standard for pre-engineered galley duct fixed fire-extinguishing systems. CO2 fire-extinguishing systems, which are not pre-engineered fixed fire-extinguishing systems, should be designed according to the requirements set out in Ch 8, 503. 1 (1) of the Rules (spaces containing flammable liquids) or another suitable standard acceptable to the Society. <i>(2020)</i></u></p> <p>2. ~ 3. <omitted></p>	<p style="text-align: center;">CHAPTER 7 CONTAINMENT OF FIRE</p> <p style="text-align: center;">Section 1 ~ Section 5 <omitted></p> <p style="text-align: center;">Section 6 Ventilation Systems</p> <p>601. ~ 603. <omitted></p> <p>605. Exhaust ducts from galley ranges <i>(2017)</i></p> <p>1. The exhaust ducts from galley ranges are to be in accordance with the following requirements:</p> <p>(1) ~ (2) <same as the present></p> <p>(3) In case where the carbon dioxide gas fire extinguishing system specified in 403. of the Rules is provided as fixed means for extinguishing a fire within the exhaust duct, the quantity of fire extinguishing medium is to be 100% or more of the volume of the duct spaces to be protected.</p> <p>(4) With respect to fixed means for extinguishing a fire specified in 1 (3) & 3 (4) of the rules, these are to be apply ISO 15371 which is given as an example of a suitable performance standard for pre-engineered galley duct fixed fire-extinguishing systems. CO2 fire-extinguishing systems, which are not applicable to ISO 15371 should be designed according to the requirements set out in Ch 8, 503. 1 (1) of the Rules (spaces containing flammable liquids) or another suitable standard acceptable to the Society. <i>(2020)</i></p> <p>2. ~ 3. <same as the present></p>	

Annex 8–9 Special Requirements of Fire Protection and Fire Extinction for Cargo Ships

Section 1 General Requirements

101. Application

The AFP(Additional Fire Protection and fire extinction) notations as additional special features are given to the cargo ships complying with the requirements of this annex, and the details are as follows.

- (1) AFP–A: Ships whose accommodation spaces comply with the requirement of **Sec 2**.
- (2) AFP–M: Ships whose machinery spaces comply with the requirement of **Sec 3**.
- (3) AFP–C: Ships whose cargo areas comply with to the requirement of **Sec 4**.
- (4) Requirements of **Sec 2**, **Sec 3** and **Sec 4** can be combined and applied. In case the cargo ship which complies with **Sec 2** and **Sec 3** is given a notation “AFP–AM” as addition special feature notation.

Section 2 Protection of Accommodation Spaces

201. Application

1. This section is applicable to the cargo ships which apply to the notation AFP–A.

202. Fire growth probability

1. Furniture in stairway enclosures

- (1) Furniture in stairway enclosures is to be limited to seating. It is to be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk determined in accordance with the FTP Code, and is not to restrict the passenger escape route.
- (2) Furniture is not to be permitted in corridors forming escape routes in cabin areas. In addition to the above, lockers of non-combustible material, providing storage for non-hazardous safety equipment required by these regulations, may be permitted.

203. Fixed fire detection and fire alarm system

A individually identifiable fixed fire detection and fire alarm system is to be installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors, stairways and escape routes within accommodation spaces. Heat detectors in lieu of smoke detectors may be installed in galleys and refrigerated chambers. Spaces having little or no fire risk such as voids, public toilets, private bathrooms, carbon dioxide rooms and similar spaces need not be fitted with a fixed fire detection and alarm system. Detectors fitted in cabins, when activated, are also to be capable of emitting, or cause to be emitted, an audible alarm within the space where they are located.

204. Containment of Fire

1. Method of protection in accommodation

The IC method specified in **Ch 7, 103. 1** of the Rules is to be adopted in accommodation, service spaces and control places.

2. Bulkheads

- (1) All compartment bulkheads, linings, and ceilings in accommodation, service spaces and control stations are to be at least “B–15” class. Private sanitary units are consider as part of the cabin where they are located, and the bulkheads and doors inside the cabin may be reduced to “C” class divisions.
- (2) Corridors in accommodation areas are to be divided by “B–15” class self-closing doors every 20m of the maximum distance. For corridors which transverse corridors and longitudinal corridors are connected to each other, “B–15” class self-closing doors are to be installed if the total length exceeds 20m.

3. Fire integrity of bulkheads and decks

- (1) All decks in accommodation, including corridors, and service spaces, are to be at least "A-0" class.(2) All bulkheads and decks separating the accommodation spaces from the machinery spaces, cargo holds, ballast pump room and cargo pump room are to have "A-60" class. This requirement does not apply to service spaces such as air-conditioning rooms and service trunks and only serving accommodation and other machinery spaces specified in ⑦ of **Ch 7, 103. 3** (2) (B) of the Rules located within the accommodation area.
- (3) All doors fitted in the corridor bulkheads in cabins and public spaces are to be of self-closing type. Normally locked doors need not to comply with this requirement.

205. Means of escape

1. A corridor, lobby, or part of a corridor from which there is only one route of escape is to be prohibited. Dead-end corridors used in service areas which are necessary for the practical utility of the ship, such as fuel oil stations and athwartship supply corridors, are to be permitted, provided such dead-end corridors are separated from accommodation areas. Also, a part of a corridor that has a depth not exceeding its width is considered a recess or local extension and is permitted.
2. Spaces exceeding 30m² are to be provided with at least two widely separated means of escape. Such means of escape are to be a door having direct access to a corridor, a stairway or an open deck.

Section 3 Protection of Machinery Spaces

301. Application

1. This section is applicable to the cargo ships which apply to the notation AFP-M.

302. Possibility of ignition

1. Measures for fuel oil

Oil fired thermal oil heaters and incinerators are subject to the same segregation requirements as fuel oil purifiers. They are to be arranged in a separate room, enclosed by steel bulkheads extending from deck to deck and provided with self-closing steel doors.

2. Hydraulic system

The hydraulic system of **Pt 5, Ch 6, Sec 13** of the Rules is to be located outside the main engine or boiler room.

303. Fire detection and fire alarm systems

1. Fire detection systems

- (1) All machinery spaces, including auxiliary machinery spaces, are to be equipped with fire detection systems.
- (2) Two or more types of fire detection systems are to be installed to protect the machinery spaces of category A. Smoke detectors and flame detectors are to be installed in the vicinity of engines, fuel oil purifiers, oil boilers and similar equipment.
- (3) Smoke detectors located in the workshop should be connected to a timer function that resets automatically after a maximum of 30 minutes.

2. TV monitoring systems

- (1) Machinery spaces of category A are to be equipped with color TV monitoring systems to monitor all hot spots of all major equipment such as engines having rated output above 375kW, heated oil separators, oil boilers and emergency diesel engines when it is used in ports. TV monitoring systems are to be located in a continuously manned control station or engine control room.

304. Containment of fire

1. In machinery spaces of category A, at least one exhaust ventilation fan is to be powered from an emergency power source so as to permit the discharge of smoke and gas extinguishing agents(if used) after a fire.

305. Local application system

1. The local application system is to be capable of automatic release.
2. The operation of the system is to be controlled by a combination of flame and smoke detectors. The detection system is to provide an alarm upon activation of any single detector and the fire extinguishing system is to be operated when two or more detectors are activated. The zones in which detection systems are fitted are to correspond to the zones of extinguishing system.

306. Central Control Station

1. The controls required by the following requirements are to be located in the central control station. It is to have safe access from the open deck.
 - (1) Ch 3, 102. 1 to 4 of the Rules
 - (2) Ch 6, 201. of the Rules
 - (3) Ch 7 204. 1 of the Rules
 - (4) Controls for any required fire extinguishing systems and TV monitoring systems.
2. However, controls for activation of the fixed fire extinguishing system in machinery spaces of category A and controls for closing the fuel oil valve are to be easily accessible but may be installed outside the central control station.

307. Escape

1. Two means of escape are to be provided from the machinery control rooms located within the machinery space, at least one of which is to be continuous fire shelter to a safe location outside the machinery spaces. This is also applicable to the workshops and, where possible, to auxiliary machinery spaces.

Section 4 Protection of Cargo areas

401. Bulk Carrier

1. Application

This article is applicable to the bulk carriers which apply to the notation AFP-C.

2. fire detection and fire alarm system

All cargo holds are to be fitted with either a fixed fire detection and fire alarm system complying with the requirements of Ch 9 of the FSS Code or a sample extraction smoke detection system complying with the requirements of Ch 10 of the FSS Code.

3. fire fighting

- (1) Cargo spaces are to be provided with a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the FSS Code or with a fire-extinguishing system which, in the opinion of the Society, gives equivalent protection for the cargoes carried.
- (2) The exemption requirement as referred in Ch 8, 601. 4 of the Rules do not apply to ships intended for the additional notation AFP-C.

402. Ro-ro ship and vehicle carrier

1. Application

This article is applicable to the ro-ro ship and vehicle carrier which apply to the notation AFP-C.

2. fire detection and fire alarm system

A fixed fire detection and fire alarm system is to be capable of individually identifying each detector.

403. Tanker

1. Application

This article is applicable to the tanker and chemical tanker which apply to the notation AFP-C.

2. Inert gas system

An inert gas system complying with **Annex 8-5** is to be provided for all tankers. However, this is not applicable for tankers engaged in the carriage of oil with flashpoint above 60°C.

3. fire detection and fire alarm system

- (1) A fixed fire detection and fire alarm system is to be of an approved type and complying with the requirements of **Ch 9** of the FSS Code.
- (2) Repeater panel is to be located in the wheelhouse.

4. fire main and hydrants

- (1) The fire main on deck is to be arranged as a ring main laid to the port and starboard side.
- (2) Isolation valves are to be globe valves of steel or fire safe butterfly valves.
- (3) Main fire pumps are to be remote-controlled from the wheelhouse.

5. water spray system

- (1) If lifeboats are not separated from cargo spaces by steel bulkheads, a manual water spraying system covering with a uniformly distributed water application rate of at least 10 l/min/m² over the sides and top of each lifeboat is to be provided. It may be taken from the fire main with the isolating valve located outside the protected area.
- (2) If the capacity of the fire pumps is sufficient for simultaneous activation of the water spraying system and the fire main system. The system is to be remote-controlled from the wheelhouse.

6. foam system

- (1) For oil tankers of less than 8,000 tonnes deadweight, foam from the fixed foam system is to be supplied by means of monitors and foam applicators.
- (2) Tankers of 8,000 tonnes deadweight and upwards need an independent foam main, arranged along the centre line as a single line with foam outlet branches to both port and starboard arranged just aft of each monitor. At least two foam mixing units and two foam concentrate pumps are to be provided, placed together with the storage tank for foam concentrate in a dedicated room. Foam concentrate sufficient for 30 minutes of continuous foam production are to be stored onboard. Two foam monitors at each side of the accommodation front and monitors covering the cargo manifold are to be remote-controlled from the bridge or from another safe area with a good visibility to the monitors coverage area.

404. Liquefied gas carriers

1. Application

This article is applicable to the tanker and chemical tanker which apply to the notation AFP-C.

2. fire main and hydrants

- (1) The fire main on deck is to be arranged as a ring main laid to the port and starboard side.
- (2) Isolation valves are to be globe valves of steel or fire safe butterfly valves.
- (3) Main fire pumps are to be remote-controlled from the wheelhouse.

3. water spray system

- (1) If lifeboats are not separated from cargo spaces by steel bulkheads, a manual water spraying system covering with a uniformly distributed water application rate of at least 10 l/min/m² over the sides and top of each lifeboat is to be provided. It may be taken from the fire main with the isolating valve located outside the protected area.
- (2) If the capacity of the fire pumps is sufficient for simultaneous activation of the water spraying system and the fire main system. The system is to be remote-controlled from the wheelhouse.

4. dry chemical powder fire extinguishing system

Dry chemical powder fire-extinguishing systems is to be installed in accordance with **Pt7, Ch 5, 1104. 2** of the Rules. The dry powder quantity is to be stored on board to provide a minimum of 60 seconds operation.

5. fire detection and fire alarm system

- (1) All cargo holds are to be fitted with a fixed fire detection and fire alarm system is to be of an approved type complying with the requirements of **Ch 9** of the FSS Code and so installed and arranged as to provide smoke detection in enclosed spaces such as cargo pump room, compressor room, reliquefaction room, re-gasification spaces, and electric motor room within the cargo area.
- (2) Repeater panel is to be located in the wheelhouse.

6. fixed gas fire-extinguishing system

- (1) Enclosed spaces containing cargo handling equipment, such as compressor and pump rooms, reliquefaction room, regasification spaces, and electric motor room within the cargo area are to be provided with the one of following;
 - (A) a fixed gas fire-extinguishing system complying with the requirements of **Ch 5** of FSS Code, taking into account the necessary concentrations required for extinguishing gas fires; or
 - (B) a water mist fire-extinguishing system complying with the requirements of **Ch 7** of FSS Code.
- (2) A fixed fire-extinguishing system at the vent outlet is to be provided inside venting masts for cargo tank venting system by nitrogen, CO₂ or other suitable medium.

Amendments of the Guidance relating to the Rules

(External Opinion Inquiry)

Pt. 8 Fire Protection and Fire Extinction



2021. 01.

Rule Development Team

– Main Amendments –

(1) Effective Date : 1 June 2021(based on application date for classification)

- Reflection of internal request for rule revision

Present	Amendment
<p style="text-align: center;">CHAPTER 2 PROBABILITY OF IGNITION</p> <p style="text-align: center;">Section 1 ~ 3 <omitted></p> <p style="text-align: center;">Section 4 Cargo Areas of Tankers</p> <p>401. Separation of cargo oil tanks</p> <ol style="list-style-type: none"> 1. <omitted> 2. In applying 401. 2 of the Rules, arrangement of main cargo control stations, control stations, accommodation spaces and service spaces is to comply with the following requirements: [See Rule] <ol style="list-style-type: none"> (1) Main cargo control stations, control stations, accommodation spaces and service spaces(including chain lockers) are not to make point contact or linear contact with cargo oil tanks or slop tanks. <u>However, they may make point contact or linear contact with cargo pump rooms and cofferdams.</u> (2) Main cargo control stations, control stations, accommodation spaces and service spaces need not 3. ~ 7. <omitted> <p>402. ~ 410. <omitted></p>	<p style="text-align: center;">CHAPTER 2 PROBABILITY OF IGNITION</p> <p style="text-align: center;">Section 1 ~ 3 <same as the present></p> <p style="text-align: center;">Section 4 Cargo Areas of Tankers</p> <p>401. Separation of cargo oil tanks</p> <ol style="list-style-type: none"> 1. <same as the present> 2. In applying 401. 2 of the Rules, arrangement of main cargo control stations, control stations, accommodation spaces and service spaces is to comply with the following requirements: [See Rule] <ol style="list-style-type: none"> (1) Main cargo control stations, control stations, accommodation spaces and service spaces(including chain lockers) are not to make point contact or linear contact with cargo oil tanks or slop tanks. However, they may make point contact or linear contact with cargo pump rooms and cofferdams. (2) Main cargo control stations, control stations, accommodation spaces and service spaces need not 3. ~ 7. <same as the present> <p>402. ~ 410. <same as the present></p>

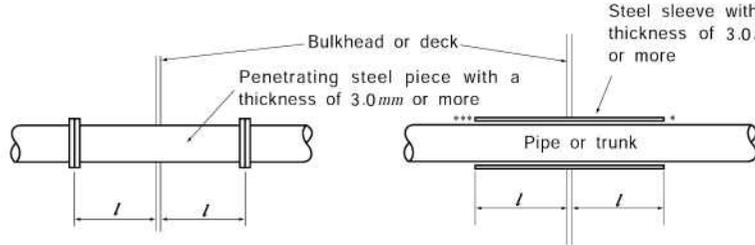
Present

Annex 8-2 Penetrations through Divisions

1. Penetrations of Pipes or Trunks

1.1 Penetrations through "A" and "B" class divisions (steel or equivalent material) (2020) <omitted>

1.2 Pipes and trunks made of materials readily rendered ineffective by heat (PVC, FRP, aluminium alloy, lead, etc)

Division	Details of penetrations
"A" class division	 <p>The thickness of penetrating pieces or steel sleeves may be that of the carbon steel pipes for ordinary piping of national standard according to their nominal diameter.</p>
"B" class division	<omitted>
<omitted>	

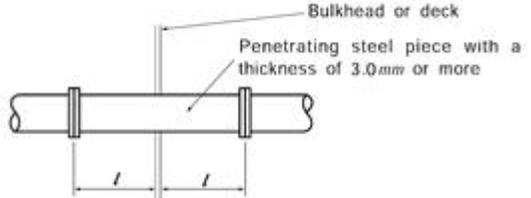
Amendment

Annex 8-2 Penetrations through Divisions

1. Penetrations of Pipes or Trunks

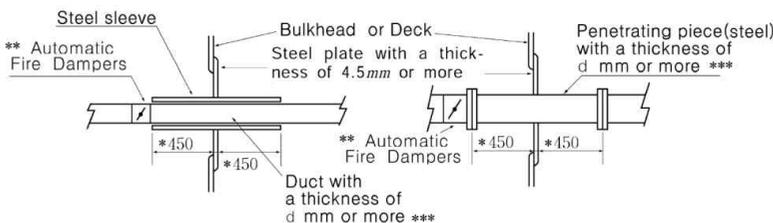
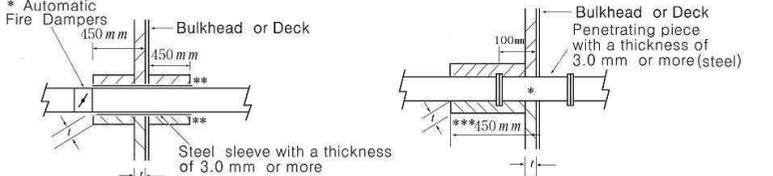
1.1 Penetrations through "A" and "B" class divisions (steel or equivalent material) (2020) <same as the present>

1.2 Pipes and trunks made of materials readily rendered ineffective by heat (PVC, FRP, aluminium alloy, lead, etc)

Division	Details of penetrations
"A" class division	 <p>The thickness of penetrating pieces or steel sleeves may be that of the carbon steel pipes for ordinary piping of national standard according to their nominal diameter.</p>
"B" class division	<same as the present>
<same as the present>	

Present

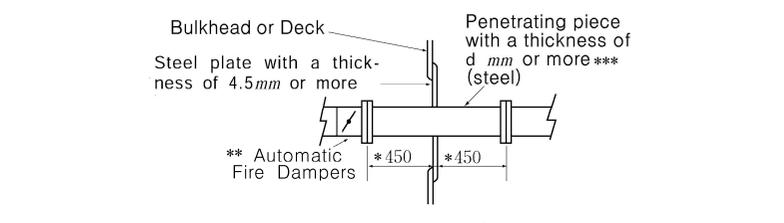
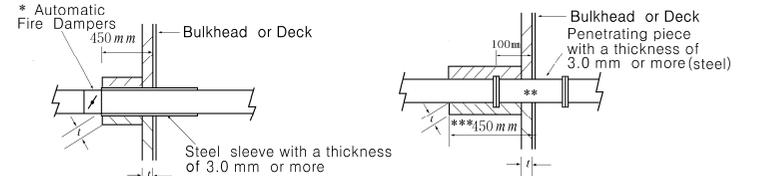
2. Penetrations of Ventilation Ducts

Division	Penetrations of ventilation ducts
"A" class	 <p>* When free cross-sectional Duct area $\leq 0.02 \text{ m}^2$, it may be reduced to 100 mm (Only, in the case of the deck, wholly laid on the lower side of the decks pierced)</p> <p>** When free cross-sectional Duct area $> 0.075 \text{ m}^2$</p> <p>*** $0.075 \text{ m}^2 \leq A \leq 0.45 \text{ m}^2$: $d = 4.0 \text{ mm}$ $A > 0.45 \text{ m}^2$: $d = 5.0 \text{ mm}$ A: free cross-sectional area of the duct</p>
"B" class	(omitted)
Prevention of heat treatment	 <p>* Automatic Fire Dampers</p> <p>Bulkhead or Deck</p> <p>Penetrating piece with a thickness of 3.0 mm or more (steel)</p> <p>Steel sleeve with a thickness of 3.0 mm or more</p> <p>* (If needed)</p> <p>** May be omitted except in cases where fire damper</p> <p>* Free cross-sectional area $\leq 0.02 \text{ m}^2$</p> <p>*** In case the penetrations passes the FTP code test (In case of having the equal fire integrity with 450 mm) or in case penetration piece and duct connection part have a structure that heat can not be transferred, 100 mm is admitted.</p>
	(omitted)

3. (omitted)

Amendment

2. Penetrations of Ventilation Ducts

Division	Penetrations of ventilation ducts
"A" class	 <p>* When free cross-sectional Duct area(A) $\leq 0.02 \text{ mm}^2$, it may be reduced to 100 mm (Only, in the case of the deck, wholly laid on the lowed side of the decks pierced)</p> <p>** When $A > 0.075 \text{ mm}^2$</p> <p>*** $A < 0.075 \text{ m}^2$: $d = 3.0 \text{ mm}$ $0.075 \leq A \leq 0.45 \text{ m}^2$: $d = 4 \text{ mm}$ $A > 0.45 \text{ m}^2$: $d = 5 \text{ mm}$</p>
"B" class	(same as the present)
Prevention of heat treatment	 <p>* Automatic Fire Dampers</p> <p>Bulkhead or Deck</p> <p>Penetrating piece with a thickness of 3.0 mm or more (steel)</p> <p>Steel sleeve with a thickness of 3.0 mm or more</p> <p>* (If needed)</p> <p>** Free cross-sectional area $\leq 0.02 \text{ m}^2$</p> <p>*** In case the penetrations passes the FTP code test (In case of having the equal fire integrity with 450 mm) or In case penetration piece and duct connection part have a structure that heat can not be transferred, 100 mm is admitted.</p>
	(same as the present)

3. (same as the present)

Amendments of the Guidance Relating to the Rules for Classification of Steel Ships

(external opinion inquiry)

Pt. 8 Fire Protection and Fire Extinction



2021.02.

Machinery Rule Development Team

- Main Amendments -

(1) Effective date : 1 July 2021 (based on contract date for construction)

● Guidance Ch.9 Sec.8 has been moved to the Rules.

Present	Amendment	Note
<p>CHAPTER 3 FIRE GROWTH POTENTIAL</p> <p>Section 1 Control of Air Supply and Flammable Liquid to The Spaces</p> <p>101. Closing appliances and stopping devices of ventilation</p> <p>1. ~ 2. <omitted></p> <p>3. In applying 101. 1 of the Rules, emergency generator rooms <u>are to</u> be provided with ventilation openings for the admission of combustion air to engines and the removal of heat. These openings are usually provided with louvers which can be closed (when fire breaks out in emergency generator rooms). The louvers may be hand operated or power operated. Alternatively, the louvers may be of fixed type with a closing door which may be hand operated or automatic.</p> <p><hereafter, omitted></p> <p>CHAPTER 8 FIRE FIGHTING</p> <p>Section 6 Fire-extinguishing Arrangements In Cargo Spaces</p> <p>601. Fixed gas fire-extinguishing systems for general cargo (2018) [See Rule]</p> <p>1. ~ 2. <omitted></p> <p>3. In applying 601. 4 of the Rule, “cargoes which constitute a low fire risk” means that all cargoes listed in appendix 1, entry for coal of the IMSBC Code and the lists of solid bulk cargoes for which a fixed gas fire-extinguishing system may be exempted of for which a fixed gas fire-extinguishing system is in effective (MSC.1/Circ.1395/Rev.3). (2019)</p>	<p>CHAPTER 3 FIRE GROWTH POTENTIAL</p> <p>Section 1 Control of Air Supply and Flammable Liquid to The Spaces</p> <p>101. Closing appliances and stopping devices of ventilation</p> <p>1. ~ 2. <same as the present></p> <p>3. In applying 101. 1 of the Rules, emergency generator rooms <u>may</u> be provided with ventilation openings for the admission of combustion air to engines and the removal of heat. These openings are usually provided with louvers which can be closed (when fire breaks out in emergency generator rooms). The louvers may be hand operated or power operated. Alternatively, the louvers may be of fixed type with a closing door which may be hand operated or automatic. <i>(2021)</i></p> <p><hereafter, same as the present></p> <p>CHAPTER 8 FIRE FIGHTING</p> <p>Section 6 Fire-extinguishing Arrangements In Cargo Spaces</p> <p>601. Fixed gas fire-extinguishing systems for general cargo (2018) [See Rule]</p> <p>1. ~ 2. <omitted></p> <p>3. In applying 601. 4 of the Rule, “cargoes which constitute a low fire risk” means that all cargoes listed in appendix 1, entry for coal of the IMSBC Code and the lists of solid bulk cargoes for which a fixed gas fire-extinguishing system may be exempted of for which a fixed gas fire-extinguishing system is in effective (MSC.1/Circ.1395/Rev.4). (2021)</p>	<p>(amendment) -correction</p> <p>- Has been reflected new MSC Circ.</p>

Present	Amendment	Note
<p>Annex 8-4 Alleviation Requirements for Fishing Vessels</p> <p>1. ~ 5. <omitted></p> <p>6. Fixed fire detection and fire alarm systems need not apply to fishing vessels.</p> <p>7. ~ 14. <omitted></p> <p>Annex 8-5 Inert Gas Systems</p> <p>1. <omitted></p> <p>2. General requirements</p> <p>(1) ~ (9) <omitted></p> <p>(10) Inert gas lines</p> <p>(A) ~ (B) <omitted></p> <p>(C) Each cargo tank not being inerted shall be capable of being separated from the inert gas main by:</p> <p>(a) removing spool-pieces, valves or other pipe sections, and blanking the pipe ends; or</p> <p>(b) arrangement of two spectacle flanges in series with provisions for detecting leakage into the pipe between the two spectacle flanges</p> <p>(c) <newly added></p>	<p>Annex 8-4 Alleviation Requirements for Fishing Vessels</p> <p>1. ~ 5. <same as the present></p> <p>6. Fixed fire detection and fire alarm systems need not apply to fishing vessels. <u>For vessels apply to the Fishing Vessel Act is to be complied with Regulations for Fishing Vessel's Equipment" in Korean Fishing Vessel Act.</u></p> <p>7. ~ 14.<same as the present></p> <p>Annex 8-5 Inert Gas Systems</p> <p>1. <same as the present></p> <p>2. General requirements</p> <p>(1) ~ (9) <same as the present></p> <p>(10) Inert gas lines</p> <p>(A) ~ (B) <same as the present></p> <p>(C) Each cargo tank not being inerted shall be capable of being separated from the inert gas main by:</p> <p>(a) removing spool-pieces, valves or other pipe sections, and blanking the pipe ends; or</p> <p>(b) arrangement of two spectacle flanges in series with provisions for detecting leakage into the pipe between the two spectacle flanges</p> <p>(c) <u>equivalent arrangements to the satisfaction of the Administration, providing at least the same level of protection.</u></p>	<p>(amendment)</p> <p>- Has been reflected the amendment of Fishing Vessel's Equipment</p> <p>- Has been added to reflect the FSS Code Ch 15, 2.2.3.2.3</p>

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Annex 8-9 Special Requirements of Fire Protection and Fire Extinguishing for Cargo Ships

Section 1 General Requirements (2021)

101. Application

The AFP notations as additional special features are given to the cargo ships complying with the requirements of this annex, and the details are as follows.

- (1) AFP-A: Ships whose accommodation spaces comply with the requirement of **Section 2**.
- (2) AFP-M: Ships whose machinery spaces comply with the requirement of **Section 3**.
- (3) AFP-C: Ships whose cargo spaces comply with to the related requirement of **Section 4**. In case the container ships, the class notation as following may be assigned to ships which have been constructed to comply with the related requirements.
 - (A) AFP-C(1): Container ships whose cargo spaces comply with the requirement of **405. 2**
 - (B) AFP-C(2): Container ships whose cargo spaces comply with the requirement of **405. 3**
 - (C) AFP-C(3): Container ships whose cargo spaces comply with the requirement of **405. 4**
 - (D) AFP-C(FSC): Container ships whose cargo spaces comply with the requirement of **405. 5**
- (4) Requirements of **Section 2**, **Section 3** and **Section 4** can be combined and applied. In case the cargo ship which complies with **Section 2** and **Section 3** is given a notation "AFP-AM" as addition special feature notation.

Section 2 ~ Section 3 <omitted>

Section 4 Protection of Cargo areas

401. ~ 404. <omitted>

405. Container ships

1. Application

This article is applicable to the container ships which apply to the following notations.

- (1) AFP-C(1): Container ships whose cargo spaces comply with the requirement of **405. 2**
- (2) AFP-C(2): Container ships whose cargo spaces comply with the requirement of **405. 3**
- (3) AFP-C(3): Container ships whose cargo spaces comply with the requirement of **405. 4**
- (4) AFP-C(FSC): Container ships whose cargo spaces comply with the requirement of **405. 5**

2. AFC-C(1)

- (1) Water mist lances which comply with **Ch 8, 603. 1** of the **Rules** are to be provided.

- (2) Mobile water monitors

In addition to the water mist lance, the ship is to be provided with mobile water monitors, capable to reach the highest level of containers or the 5th tier of containers above the upper lashing bridge, whichever is the lowest.

- (3) Fire-fighter's outfits

(A) Ships shall carry at least six(6) fire-fighter's outfits.

(B) Two spare charges shall be provided for each required breathing apparatus.

(C) At least two breathing air compressors are to be supplied from the main and emergency switch-board, or independently driven, complete with all fittings necessary for recharging the cylinders of air breathing apparatuses. The compressors are to be located in at least two sheltered and widely separated positions.

- (4) Device for fire patrols

A portable thermal imaging camera is to be provided. In case of the device to be used in hazardous area, it shall be of a certified type.

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3. AFC-C(2)

In addition to the requirements of 2, ships assigned with the notation AFC-C(2) are to comply with this article.

(1) Central control station

The control and monitoring functions of fire safety system should be concentrated which is continuously manned central control station. The following functions are to be provided at the central control station and may be the wheelhouse or a dedicated fire control station continuously manned by a responsible member of the crew.

(A) Audible and visual alarms upon activation of the container hold fire detection system

(B) Indicators to identify the container hold where fire, heat and/or smoke have been detected.

(C) Devices for the crew to manually operate the fire extinguishing system serving the container holds.

(D) Shut-down for all mechanical ventilation systems of container hold

(E) Display and alarm systems for ventilation system

(F) Other functions considered necessary for safety

(2) A fixed fire detection and fire alarm system

Under deck cargo holds are to be fitted with either a fixed fire detection and fire alarm system or a sample extraction smoke detection system required is to be complied with the FSS Code.

(3) Fire main

(A) The fire main is to be arranged as a ring main laid to the port and starboard side with isolation valves installed at regular intervals. As a minimum it is to be possible to isolate the following sections from the rest of the fire main:

(a) Sections of the fire main serving accommodation, machinery, service spaces and control stations located in each superstructure block or in the forecastle

(b) Sections of the fire main serving cargo holds and cargo stowage areas on deck located aft of superstructure blocks, between two superstructure blocks or forward of the superstructure blocks.

(B) Isolation valves are to be steel globe valves or fire safe butterfly valves.

(C) Arrangements are to be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote arrangements for the fire pumps.

(D) The quantity of water delivered is to be capable of supplying four nozzles of a size and at pressures as specified in **Ch 8, 101. 6** of the **Rules** and **Ch 8, 103. 3** of the **Rules**.

(E) The arrangement of the hydrants and fire hoses is to be such that it is possible to reach any part of the cargo holds and stowage areas on deck when empty with two jets of water not emanating from the same hydrant, one of which is to be from a single length of hose.

(F) The capacity of the fire pump and fire main diameter are to be sufficient for the simultaneous use of the following combinations of systems, whichever is the most demanding:

(a) Combination of fire main four nozzles as required by (E), water-spray system below hatch cover, one water monitor as required by (4) and superstructure block protection water-spray

(b) Combination of fire main four nozzles as required by (E), mobile water monitors required by 2 (1) or **Ch 8, 603. 2** of the **Rules**

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- (4) Fixed water monitors covering the ondeck cargo area
- (A) The arrangement, height and length of throw of the monitors is to be such that any point on the top of the container stacks can be reached by the water jet from one monitor, taking into account the maximum height of the container stacks.
 - (B) The capacity of the pump and arrangement of the piping system supplying water to the water monitors is to be sufficient to achieve the full throw of any one monitor. The system may be fed by the fire pumps provided their capacity is in accordance with (3) (F).
 - (C) Water supply to the system is to comply with one of the following.
 - (a) The system is to be supplied by the fire pumps and compliance with (3) (F) is to be ensured; or
 - (b) The system is to be supplied by dedicated pumps and as a backup the main supply line of the system is to be connected to the fire main through a stop valve located as far as possible from the container cargo holds and cargo area on deck; or
 - (c) The system is to be provided with a redundant means of pumping. The capacity of the redundant means is to be sufficient to compensate for the loss of any single supply pump. Failure of any one component in the power and control system should not result in a reduction of required pump capacity by more than 50%. Switch over to redundant means of pumping may be manual or automatic.
 - (D) Pump and monitor controls are to be available at a single position.
 - (E) Water monitors are to be of an approved type and are to be capable of supplying a continuous full water jet without significant pulsations and compacted in such a way as to be concentrated on a limited surface. Monitors are to be of robust construction and capable of withstanding the reaction forces of the water jet.
 - (F) Scuppers are to be fitted so as to ensure that the water is rapidly discharged overboard. Means are to be provided to prevent the blockage of drainage arrangements and any obstruction to the flow of water towards the scuppers, e.g. due to horizontal structures on deck, is to be avoided.
- (5) Water-spray system below hatch cover
- (A) Means are to be provided for effectively cooling under-deck cargo holds by at least 20 L/min per square metre of the horizontal area of cargo spaces by a fixed arrangement of spraying nozzles. Alternatively, equivalent water-mist systems may be considered on a case-by-case basis, based on suitable fire testing, to the satisfaction of the Society.
 - (B) The valve controls and pump controls necessary to activate the system are to be concentrated in the central control station.
 - (C) The system supply equipment and piping are to be located outside the protected cargo holds and all power supply components (including cables) are to be installed outside of the protected cargo holds.
 - (D) It is to be possible to supply each nozzle in any cargo hold from piping located on either side of the ship.
 - (E) The capacity of the system water supply is to be sufficient to feed the water-spray in any one cargo hold. The system may be fed by the fire pumps provided their capacity is in accordance with (3) (F).
 - (F) Isolating valves are to be provided to separate the section of the system located inside each cargo hold from the rest of the system. The isolating valves are to be located outside of the protected cargo hold and capable of remote release.

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- (G) Water supply to the system is to comply with one of the following.
- (a) The system is to be supplied by the fire pumps and compliance with (3) (F) is to be ensured; or
 - (b) The system is to be fed by dedicated pumps and as a backup the main supply line of the system is to be connected to the fire main through a stop valve located as far as possible from the container cargo holds and cargo area on deck; or
 - (c) The system is to be provided with a redundant means of pumping. The capacity of the redundant means is to be sufficient to compensate for the loss of any single supply pump. Failure of any one component in the power and control system should not result in a reduction of required pump capacity by more than 50%. Switch over to redundant means of pumping may be manual or automatic.
- (H) An international shore connection is to be available.
- (I) The drainage system shall be sized to remove no less than 125 % of the combined capacity of both the water spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Society in its approval of the stability information.
- (J) For drainage system in which dangerous goods are intended to be carried, Ch 12, 201. 5 of the Rules applies.
- (6) Water-spray system for the superstructure block
- (A) A fixed water-spraying system is to be installed to cover the exposed superstructure vertical boundaries facing container areas, except boundaries of the forecastle spaces, foundations of the monitors required in (4) and exposed lifeboats, liferafts and muster stations facing container areas.
 - (B) When it is demonstrated an equivalent level of protection of the superstructure blocks, it may be accepted on a case-by-case basis by the Society.
 - (C) The system is to be capable of covering the areas mentioned in (A) with a uniformly distributed water application rate of at least 10 L/min/m² for the largest projected horizontal surfaces and 4 L/min/m² for vertical surfaces.
 - (D) The number and location of spray nozzles are to be suitable to spread the sprayed water uniformly on areas to be protected.
 - (E) Water supply to the system is to comply with one of the following.
 - (a) The system is to be supplied by the fire pumps and compliance with (3) (F) is to be ensured; or
 - (b) The system is to be fed by dedicated pumps and as a backup the main supply line of the system is to be connected to the fire main through a stop valve located as far as possible from the container cargo holds and cargo area on deck; or
 - (c) The system is to be provided with a redundant means of pumping. The capacity of the redundant means is to be sufficient to compensate for the loss of any single supply pump. Failure of any one component in the power and control system should not result in a reduction of required pump capacity by more than 50%. Switch over to redundant means of pumping may be manual or automatic.
 - (F) The valve controls and pump controls necessary to activate the system are to be concentrated in the central control station.
- (7) Ventilation system
- (A) Separate and redundant means of air supply are to be provided for the accommodation spaces and control stations.
 - (B) Air inlets of the sources of supply are to be arranged both at the front and at the aft of the superstructure blocks, so that the risk of both inlets drawing in smoke simultaneously is minimized in the event of a cargo fire. This requirement need not apply to forecastle spaces. Means of remotely closing each inlet are to be provided at the continuously manned central control station.
 - (C) The ventilation openings located in the hatch covers are to be provided with quick closing devices. Power ventilation for the container cargo holds is to be fitted with controls so grouped that all fans serving one cargo hold may be stopped at once from the continuously manned central control station. It is to be possible to close all ventilation openings, except those located in the hatch covers, from the same location.

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4. AFC-C(3)

In addition to the requirements of **2** and **3**, ships assigned with the notation AFC-C(2) are to comply with this article.

(1) Portable fire-extinguishing equipment

In addition to the requirements of **2** (2), the portable fire-extinguishing equipment for stacked containers is to be able to reach the highest tier of containers, and is to be capable of spraying water inside a confined space when connected to the fire main and raised at this level.

(2) Fire-fighter's outfits

In addition to the requirements of **2** (3), four fire-fighter's outfits and two spare charges are to be provided for each required breathing apparatus.

(3) Fire detection

(A) Means are to be provided in the cargo holds to detect and locate heating cargo or a cargo fire at an early stage and identify the container or containers where the seat of the fire or thermal reaction is located. An audible and visual alarm is to be triggered in case of the temperature exceeds the temperature setting. In case of the device to be used in hazardous area, it shall be of a certified type. The efficiency and reliability of the system are to be documented to the satisfaction of the Society.

(B) Means are to be provided to detect a cargo fire on deck. For this purpose, innovative solutions may be considered, such as: thermal imaging cameras, flame detection systems, video-based fire detection, linear heat detection, where the seat of the fire or thermal reaction is located. An audible and visual alarm is to be triggered in case of the temperature exceeds the temperature setting. The efficiency and reliability of the system are to be documented to the satisfaction of the Society.

5. AFC-C(FSC)

(1) Application

(A) The FSC notation recognizes Container Carriers that are provided with specific arrangements to flood individual container holds for the purpose of extinguishing a fire in a container hold and for the dewatering thereafter.

(B) The arrangements and procedures are to permit only one (1) single container hold to be flooded at any time. Multiple holds are not to be flooded and the same is to be clearly posted at any controls associated with the arrangements.

(2) Machinery and Piping

Pumps, piping, materials and any electrical systems are to be in accordance with the applicable requirements of **Rules for the Classification of Steel Ships**.

(3) Controls

Controls for the filling and dewatering of the container holds are to comply with the following:

(A) Be located in a position that would be readily accessible during a fire in the container holds.

(B) Not to be rendered ineffective by the heat of a container hold fire.

(C) Flooding and discharge valves are to be provided with valve position indicators.

(D) The components, cabling, etc., of control system are to comply with any applicable requirements in **Pt 6 of Rules**.

(4) Water Level Indication

(A) Each container hold is to be provided with the means to identify the level of the water in the container hold.

(B) The water level indicator is to be provided at the same location as the controls.

(C) An audible and visual alarm is to be activated at the same location as the controls when water has been detected in a container hold. A means to manually silence the audible portion of the alarm may be provided.

(D) An audible and visual alarm is to be activated at the same location as the controls where the water level exceeds the elevation of the main deck.

(E) Means to monitor the water level in the duct keel is to be provided.

(F) An audible and visual alarm is to be activated at the same location as the controls when water has been detected in the duct keel.

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(5) Container Hold Filling Arrangements

(A) Every vessel is to be provided with the arrangements necessary to safely fill each container hold with sea water.

(B) The arrangements are to be capable of filling the largest container hold within twenty-four (24) hours assuming 10% of the volume of the container hold is filled with containers. Each container is assumed to have a 0.7 permeability rate. Calculations verifying the same are to be submitted.

(C) Filling arrangements for the container holds may consist of either portable or fixed arrangements. Further, the arrangements may be either a fixed filling arrangement using pumps or a combination of flooding and filling arrangements using pumps and are to comply with the following.

(a) Fixed Filling Arrangements Using Pumps

(i) Any filling arrangement using pumps is to be independent of the bilge system.

(ii) The filling arrangements may be led from the firemain and/or the ballast system provided the arrangement complies with the following:

- A branch pipe is to be provided for each individual container hold.

- The connection between the main and the branches are to be located outside the machinery space.

- Each branch line is to be fitted with a positive closing valve as well as a temporary connection arrangement (normally removed spool piece w/ blank flanges) where the branch leaves the main.

- There is to be a remote operated positive closing valve fitted at the point where the piping enters the container hold and the valve as well as the controls are not to be rendered ineffective by heat from a fire within the container hold served.

- No piping that is connected to a container hold carrying dangerous goods with toxic or flammable properties is to be routed through or connected to piping from any other container hold.

(b) Gravity Flooding Arrangements

Piping arrangements for gravity flooding of a container hold will be subject to special consideration.

(c) Other filling arrangements will be specially considered.

(6) Dewatering Arrangements for Container Holds

(A) A fixed piping arrangement to dewater each of the container holds is to be provided.

(B) The dewatering may be performed by eductors supplied from the ballast system or the fire main system. Where the eductors are supplied from the fire main, the fire pumps are to have sufficient capacity to simultaneously supply all required firefighting services as well as the eductors of any two adjacent holds.

(C) Arrangements are to be provided to safely discharge any contaminated water to another vessel or treatment facility.

(D) Other arrangements will be subject to special consideration.

(7) Prevention of Progressive Flooding

(A) Arrangements are to be provided to prevent water from a flooded container hold cannot pass to any other location on the vessel during and after a container hold fire.

(B) Any opening or interconnection within a container hold at an elevation that when the container hold is flooded could allow water to pass to another space of the vessel is to be fitted with adequate means of isolation.

(C) In addition to any other requirements, arrangements or devices intended to prevent progressive flooding such as access hatches, penetration arrangements, valves in interconnecting piping systems, etc., are to comply with the following:

(a) Not to be rendered ineffective by heat.

(b) Capable of maintaining its watertight integrity when exposed to the maximum head of water that may exist from either side of the device.

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(8) Dangerous Goods

Where a container hold is designated to carry Class 4.3 Dangerous Goods or any other cargo that is known to react hazardously with water, notification of the hazard is to be posted in location of the controls to flood the hold.

(9) Vessel Structural Integrity

The hull structure of the vessel is to be evaluated in accordance with **Pt 14 Annex 14-1** of **the Rules** with any one container cargo hold completely or partially flooded while in any operational condition.