

**RULES
FOR THE CLASSIFICATION OF
SHIPS**

*Part 17 – FIRE PROTECTION
January 2020*

*Amendments No. 2
January 2021*

CROATIAN REGISTER OF SHIPPING

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By the decision of the General Committee of Croatian Register of Shipping,

Amendments No. 2 to the
RULES FOR THE CLASSIFICATION OF SHIPS
Part 17 – FIRE PROTECTION

have been adopted on 22nd December 2020 and shall enter into force on 1st January 2021

INTRODUCTORY NOTES

These amendments shall be read together with the requirements in the Rules for the Classification of Ships, Part 17 – Fire Protection, edition January 2020, as amended by Amendments No. 1, edition July 2020.

Table 1 contains review of amendments, where items changed or added in relating to previous edition are given, with short description of each modification or addition. All major changes throughout the text are shaded.

This Part of the Rules includes the requirements of the following international Organisations:

International Maritime Organization (IMO)

- Conventions:** International Convention for the Safety of Life at Sea, 1974 (SOLAS 74) and all subsequent amendments up to and including the 2018 amendments (MSC.437(99)).
Protocol of 1988 relating to the International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS PROT 1988).
- Resolutions:** A.123(V), A.567(14), A.654(16), A.752(18), A.756(18), A.800(19), A.951(23), A.952(23), A.1021(26) and A.1116(30); MSC.98(73), MSC.206(81), MSC.217(82), MSC.256(84), MSC.265(84), MSC.266(84), MSC.269(85), MSC.284(86), MSC.291(87), MSC.292(87), MSC.307(88), MSC.308(88), MSC.311(88), MSC.327(90), MSC.338(91), MSC.339(91), MSC.365(93), MSC.367(93), MSC.380(94), MSC.392(95), MSC.403(96), MSC.404(96), MSC.408(96), MSC.409(97), MSC.410(97), MSC.421(98) and MSC.437(99).
- Circulars:** MSC/Circ.353, MSC/Circ.387, MSC/Circ.451, MSC/Circ.474, MSC/Circ.485, MSC/Circ.553, MSC/Circ.606, MSC/Circ.608 Rev.1, MSC/Circ.670, MSC/Circ.677, MSC/Circ.730, MSC/Circ.731, MSC/Circ.777, MSC/Circ.798, MSC/Circ.808, MSC/Circ.848, MSC/Circ.849, MSC/Circ.858, MSC/Circ.910, MSC/Circ.917, MSC/Circ.917/Corr.1, MSC/Circ.1002, MSC/Circ.1003, MSC/Circ.1005, MSC/Circ.1009, MSC/Circ.1035, MSC/Circ.1036, MSC/Circ.1037, MSC/Circ.1050, MSC/Circ.1081, MSC/Circ.1082, MSC/Circ.1084, MSC/Circ.1085, MSC/Circ.1086, MSC/Circ.1087, MSC/Circ.1120, MSC/Circ.1129, MSC/Circ.1142, MSC/Circ.1165, MSC/Circ.1167 and MSC/Circ.1168;
MSC.1/Circ.1002/Corr.1, MSC.1/Circ.1002/Corr.2, MSC.1/Circ.1120/Corr.1, MSC.1/Circ.1203, MSC.1/Circ.1237, MSC.1/Circ.1240, MSC.1/Circ.1242, MSC.1/Circ.1266, MSC.1/Circ.1267, MSC.1/Circ.1268, MSC.1/Circ.1269, MSC.1/Circ.1270, MSC.1/Circ.1270/Corr.1, MSC.1/Circ.1275, MSC.1/Circ.1275/Corr.1, MSC.1/Circ.1276, MSC.1/Circ.1312, MSC.1/Circ.1312/Corr.1, MSC.1/Circ.1314, MSC.1/Circ.1316, MSC.1/Circ.1317, MSC.1/Circ.1318, MSC.1/Circ.1319, MSC.1/Circ.1320, MSC.1/Circ.1322, MSC.1/Circ.1324, MSC.1/Circ.1368, MSC.1/Circ.1369/Add.1, MSC.1/Circ.1370, MSC.1/Circ.1384, MSC.1/Circ.1385, MSC.1/Circ.1386, MSC.1/Circ.1387, MSC.1/Circ.1388, MSC.1/Circ.1395/Rev.4, MSC.1/Circ.1422, MSC.1/Circ.1430/Rev.1, MSC.1/Circ.1431, MSC.1/Circ.1432, MSC.1/Circ.1433, MSC.1/Circ.1434, MSC.1/Circ.1435, MSC.1/Circ.1436, MSC.1/Circ.1437, MSC.1/Circ.1456, MSC.1/Circ.1458, MSC.1/Circ.1459, MSC.1/Circ.1471, MSC.1/Circ.1472, MSC.1/Circ.1480, MSC.1/Circ.1487, MSC.1/Circ.1488, MSC.1/Circ.1491, MSC.1/Circ.1492, MSC.1/Circ.1499, MSC.1/Circ.1501, MSC.1/Circ.1505, MSC.1/Circ.1510, MSC.1/Circ.1511, MSC.1/Circ.1514, MSC.1/Circ.1515, MSC.1/Circ.1516, MSC.1/Circ.1527, MSC.1/Circ.1528, MSC.1/Circ.1533, MSC.1/Circ.1539/Rev.1, MSC.1/Circ.1550, MSC.1/Circ.1552, MSC.1/Circ.1554, MSC.1/Circ.1555, MSC.1/Circ.1556, MSC.1/Circ.1573, MSC.1/Circ.1581, MSC.1/Circ.1582/Rev.1, MSC.1/Circ.1616;
MSC.1/Circ.1634; BLG.1/Circ.23

International Association of Classification Societies (IACS)

Unified Requirements (UR):

F1(2002), F2(2012), F3(1971), F5(1973), F6(1996), F7(1999), F13(1977), F16(2000), F20(2015), F21(1974), F26(2004), F27(1978), F29(2005), F32(1976), F33(1981), F35(2005), F41(1993), F42(1995), F43(2002) and F44(2010);

Unified Interpretations (UI):

SC16(2006), SC17(2020), SC25(2005), SC30(2005), SC32(2005), SC34(2005), SC35(2013), SC39(2005), SC41(2005), SC42(2007), SC43(2007), SC45(2005), SC46(2005), SC48(2005), SC49(2010), SC52(2005), SC54(2005), SC55(2005), SC57(2005), SC58(2005), SC60(2005), SC61(2005), SC62(2005), SC63(2005), SC64(2005), SC70(2010), SC73(2005), SC75(2005), SC79(2015), SC84(2005), SC85(2005), ~~SC86(2005)~~, SC87(2005), SC89(2018), SC90(2005), SC91(2020), SC92(2005), SC97(2005), SC98(2005), SC99(2014), SC100(2014), SC101(2005), SC102(2005), SC103(2005), SC106(2005), SC107(2005), SC108(2005), SC109(2005), SC110(2005), SC111(2005), SC114(2005), ~~SC117(2005)~~, SC118(2015), SC119(2005), SC120(2006), SC121(2005), SC125(2010), SC126(2005), SC127(2005), SC128(2005), SC129(2005), SC130(2005), SC132(2013), SC140(2011), SC146(2005), SC147(2005), SC148(2015), SC149(2012), SC150(2005), SC158(2005), SC159(2005), SC160(2005), SC162(2005), SC163(2009), SC164(2005), SC166(2005), SC167(2005), SC168(2005), SC169(2003), SC170(2005), SC172(2005), SC173(2003), SC174(2006), SC175(2003), SC176(2004), SC178(2011), SC188(2015), SC192(2004), SC196(2005), SC197(2006), SC198(2005), SC199(2005), SC200(2005), SC201(2006), SC204(2006), SC205(2006), SC211(2007), SC214(2006), SC217(2007),

SC218(2007), SC219(2007), SC239(2010), SC240(2011), SC241(2010), SC243(2012), SC245(2012), SC247(2011), SC250(2012), SC252(2011), SC253(2016), SC260(2015), SC262(2015), SC264(2013), SC268(2014), SC269(2016), SC270(2015), SC271(2015), SC272(2015), SC273(2015), SC275(2016), SC276(2016), SC277(2016), SC278(2016), SC282(2016), SC284(2018), SC285(2018), SC286(2018), SC287(2018), SC288(2018), SC291(2018) and SC294(2018);
FTP1(2000), FTP2(2000), FTP3(2010), FTP4(2006), FTP5(2010) and FTP6(2015).

Recommendations (Rec.):

No.123 (2012), No.131(2013) and No.135(2014)

TABLE 1 – REVIEW OF AMENDMENTS

This review comprises amendments in relation to the Rules for the Classification of Ships, Part 17 – Fire Protection, edition January 2020, as amended by Amendments No. 1, edition July 2020.

<i>ITEM</i>	<i>DESCRIPTION OF THE AMENDMENTS</i>
SECTION 3 DEFINITIONS AND EXPLANATIONS	
Sub-item 3.1.2.18	Has been changed due to inclusion of IACS UI SC 17 Rev.3
SECTION 4 PROBABILITY OF IGNITION	
Sub-item 4.2.2.5.5	Has been changed
SECTION 9 STRUCTURAL INTEGRITY AND CONTAINMENT OF FIRE	
Sub-item 9.2.2.3.2(9)	Has been amended with reference to IMO MSC.1/Circ.1634 added
SECTION 19 CARRIAGE OF DANGEROUS GOODS	
Notes to Table 19.1	Has been changed due to deletion of IACS UI SC 86 Rev.1
Sub-item 19.3.6.1	Has been changed due to inclusion of IACS UI SC 91 Rev.1 Corr.1
SECTION 20 PROTECTION OF VEHICLE, SPECIAL CATEGORY AND RO-RO SPACES	
Sub-item 20.6.1.3	Has been changed due to inclusion of MSC.1/Circ.1430/Rev.1
SECTION 24 FIRE SAFETY SYSTEMS	
Sub-item 24.7.2.4	Has been changed due to inclusion of MSC.1/Circ.1430/Rev.1
Sub-item 24.9.2.1.4	Has been changed due to deletion of IACS UI SC 117 Rev.2
Sub-item 24.9.2.4.3	Has been changed due to deletion of IACS UI SC 117 Rev.2
Sub-item 24.15.2.2.2.2	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
Sub-item 24.15.2.2.3.2(1)	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
Sub-item 24.15.2.2.3.2(2)	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
Sub-item 24.15.2.2.3.2(6)	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
Sub-item 24.15.2.2.4.1	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
Sub-item 24.15.2.2.4.2(1)	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
Sub-item 24.15.2.2.4.5(3)	Has been changed due to inclusion of MSC.1/Circ.1582/Rev.1
ANNEX 5	
Note 6 to Table 1-1	Has been changed due to inclusion of MSC.1/Circ.1430/Rev.1

3 DEFINITIONS AND EXPLANATIONS

■ **Head 3.1 – DEFINITIONS**, sub-item 3.1.2.18 has been amended and should be read as follows:

3.1.2 For the purpose of this Part of the Rules the following definitions are adopted:

...

- .18 *Control stations* – those spaces in which the ship’s radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized. Spaces where the fire recording or fire control equipment is centralized are also considered to be a fire control station. Control stations are also:
- Safety center dedicated to the management of emergency situations.
 - Control room for propulsion machinery when located outside the machinery spaces.
 - Spaces in which the following battery sources regardless of battery capacity are located:
 - .1 emergency batteries for power supply from blackout till start of emergency generator;
 - .2 emergency batteries as reserve source of energy to radiotelegraph installation;
 - .3 batteries for start of emergency generator; and
 - .4 in general, all emergency batteries required in Rules, *Part 12 – Electrical Equipment*, Section 9.

See also IACS UI SC 17 **Rev.3** and IACS UI SC 260 Rev.1.

...

4 PROBABILITY OF IGNITION

■ **Head 4.2 ARRANGEMENTS FOR OIL FUEL, LUBRICATION OIL AND OTHER FLAMMABLE OILS,** sub-item 4.2.2.5.5 has been amended and should be read as follows:

4.2.2.5 Oil fuel piping

- .1 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, see *IACS UI SC 282*, except that restricted use of flexible pipes shall be permissible in positions where the *Register* is satisfied that they are necessary, see *recommendations published by the International Organization for Standardization, in particular publications ISO 15540:1999, Fire resistance of hose assemblies – test methods and ISO 15541:1999, Fire resistance of hose assemblies – requirements for the test bench*. Such flexible pipes and end attachments shall be of approved fireresisting materials of adequate strength and shall be constructed to the satisfaction of the *Register*. For valves fitted to oil fuel tanks and under static pressure, steel or spheroidal-graphite cast iron may be accepted. However, ordinary cast iron valves may be used in piping systems where the design pressure is lower than 7 bar and the design temperature is below 60°C.
Following additional requirement (IACS UR F 35, Rev. 8) applies:
Hose clamps and similar types of attachments for flexible pipes should not be permitted.
- .2 External high-pressure fuel delivery lines between the high-pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high-pressure line failure. A jacketed pipe incorporates an outer pipe into which the high-pressure fuel pipe is placed, forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided with an alarm in case of a fuel line failure.
- .3 Oil fuel lines shall not be located immediately above or near units of high temperature, including boilers, steam pipelines, exhaust manifolds, silencers or other equipment required to be insulated by 4.2.2.6. As far as practicable, oil fuel lines shall be arranged far apart from hot surfaces, electrical installations or other sources of ignition and shall be screened or otherwise suitably protected to avoid oil spray or oil leakage onto the sources of ignition. The number of joints in such piping systems shall be kept to a minimum.
- .4 Components of a diesel engine fuel system shall be designed considering the maximum peak pressure which will be experienced in service, including any highpressure pulses which are generated and transmitted back into the fuel supply and spill lines by the action of fuel injection pumps. Connections within the fuel supply and spill lines shall be constructed having regard to their ability to prevent pressurized oil fuel leaks while in service and after maintenance.
- .5 In multi-engine installations which are supplied from the same fuel source, means of isolating the fuel supply and spill piping to individual engines shall be provided. The means of isolation shall not affect the operation of the other engines and shall be operable from a position not rendered inaccessible by a fire on any of the engines. **This requirement is considered satisfied if operating position is located at least 5 m away from engines in any direction. If this is not possible, operating position should be protected from fire by an obstruction. The application of this criterion is not mandatory for ship of less than 500 gross tonnage navigating in restricted navigation areas 5 to 8.**
- .6 Where the *Register* may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the *Register* having regard to the fire risk.

9 STRUCTURAL INTEGRITY AND CONTAINMENT OF FIRE

■ **Head 9.2 THERMAL AND STRUCTURAL BOUNDARIES**, sub-item 9.2.2.3.2.2(9) has been amended and should be read as follows:

9.2.2.3.2 The following requirements shall govern application of the tables:

...

- .2 For determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below.
Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this Section, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements.
Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.1 and 9.2. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

...

- (9) Sanitary and similar spaces:
Communal sanitary facilities, showers, baths, water closets, etc.
Small laundry rooms.
Indoor swimming pool areas.
Isolated pantries containing no cooking appliances in accommodation spaces. **See MSC.1/Circ.1634.**
(Private sanitary facilities shall be considered a portion of the space in which they are located).

...

19 CARRIAGE OF DANGEROUS GOODS

■ **Head 19.1 PURPOSE**, notes to table 19.1 have been amended and should be read as follows:

Notes to Table 19.1

- 1 For classes 4 and 5.1 solids not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers, the ventilation rate may be reduced to not less than two air changes per hour. For classes 4 and 5.1 liquids when carried in closed freight containers, the ventilation rate may be reduced to not less than two air changes per hour. For the purpose of this requirement, a portable tank is a closed freight container. See IACS UI SC 288.
- 2 Applicable to decks only.
- 3 Applies only to closed ro-ro spaces, not capable of being sealed.
- 4 In the special case where the barges are capable of containing flammable vapours or alternatively if they are capable of discharging flammable vapours to a safe space outside the barge carrier compartment by means of ventilation ducts connected to the barges, these requirements may be reduced or waived to the satisfaction of the *Register*.
- 5 Special category spaces shall be treated as closed ro-ro spaces when dangerous goods are carried.

See IACS UI SC 86 Rev.1.

■ **Head 19.3 SPECIAL REQUIREMENTS**, sub-item 19.3.6.1 has been amended and should be read as follows:

19.3.6.1 Four sets of full protective clothing, resistant to chemical attack, shall be provided in addition to the fire-fighter's outfits required by 10.10. The protective clothing shall cover all skin, so that no part of the body is unprotected and shall be selected taking into account the hazards associated with the chemicals being transported and the standards adopted by the *Register* according to the class and physical state. *For solid bulk cargoes, the protective clothing should satisfy the equipment provisions specified in the respective schedules of the IMSBC Code for the individual substances. For packaged goods, the protective clothing should satisfy the equipment provisions specified in emergency procedures (EmS) of the Supplement to the IMDG Code for the individual substances.*

See IACS UI SC 91 Rev.1 **Corr.1**.

In cargo ships of less than 300 gross tonnage and in passenger ships not intended for international voyages of less than 500 gross tonnage, but not less than 300, not more than two sets of protective clothing are required.

20 PROTECTION OF VEHICLE, SPECIAL CATEGORY AND RO-RO SPACES

■ **Head 20.6 FIRE EXTINCTION**, sub-item 20.6.1.3 has been amended and should be read as follows:

20.6.1.3 The *Register* may permit the use of any other fixed fire-extinguishing system (see *Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in resolution A.123(V) (MSC.1/Circ.1272) and Revised Guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces (MSC.1/Circ.1430/Rev.1)*) that has been shown, by a full-scale test in conditions simulating a flowing petrol fire in a vehicle space or a ro-ro space, to be not less effective in controlling fires likely to occur in such a space.

24 FIRE SAFETY SYSTEMS

■ **Head 24.7 FIXED PRESSURE WATERSPRAYING AND WATER-MIST FIREEXTINGUISHING SYSTEMS**, sub-item 24.7.2.4 has been amended and should be read as follows:

24.7.2.4 Fixed water-based fire-fighting systems for ro-ro spaces, vehicle spaces and special category spaces

Fixed water-based fire-fighting systems for ro-ro spaces, vehicle spaces and special category spaces shall be approved by the Register based on guidelines developed by the IMO, see *Revised guidelines for approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces (MSC.1/Circ.1430/Rev.1)*.

■ **Head 24.9 FIXED FIRE DETECTION AND FIRE ALARM SYSTEMS**, sub-item 24.9.2.1.4 has been amended and should be read as follows:

24.9.2.1.4 Detectors and manual call points shall be connected to dedicated sections of the fire detection system. Other fire safety functions, such as alarm signals from the sprinkler valves, may be permitted if in separate sections. *See IACS UI SC 117 Rev.2 (taking into account 24.1.1.1).*

■ **Head 24.9 FIXED FIRE DETECTION AND FIRE ALARM SYSTEMS**, sub-item 24.9.2.4.3 has been amended and should be read as follows:

24.9.2.4.3 Arrangement of cables

- .1 Cables which form part of the system shall be so arranged as to avoid galleys, machinery spaces of category A, and other enclosed spaces of high fire risk except where it is necessary to provide for fire detection or fire alarms in such spaces or to connect to the appropriate power supply.
- .2 A section with individually identifiable capability shall be arranged so that it cannot be damaged at more than one point by a fire. *See IACS UI SC 117 Rev.2 (taking into account 24.1.1.1).*

■ **Head 24.15 INERT GAS SYSTEMS**, sub-item 24.15.2.2.2 has been amended and should be read as follows:

24.15.2.2.2 Safety measures

- .1 The inert gas system shall be so designed that the maximum pressure which it can exert on any cargo tank will not exceed the test pressure of any cargo tank.
- .2 Automatic shutdown of the inert gas system and its components parts shall be arranged on predetermined limits being reached, taking into account the provisions of 24.15.2.2.4, 24.15.2.3.2 and 24.15.2.4.2. *See IACS UI SC 284 and MSC.1/Circ.1582/Rev.1.*
- .3 Suitable shutoff arrangements shall be provided on the discharge outlet of each generator plant.
- .4 The system shall be designed to ensure that if the oxygen content exceeds 5% by volume, the inert gas shall be automatically vented to atmosphere.
- .5 Arrangements shall be provided to enable the functioning of the inert gas plant to be stabilized before commencing cargo discharge. If blowers are to be used for gasfreeing, their air inlets shall be provided with blanking arrangements.
- .6 Where a double block and bleed valve is installed, the system shall ensure upon loss of power, the block valves are automatically closed and the bleed valve is automatically open.

■ **Head 24.15 INERT GAS SYSTEMS**, sub-item 24.15.2.2.3.2 has been amended and should read as follows:

- .2 Inert gas lines
 - (1) The inert gas main may be divided into two or more branches forward of the non-return devices required by 24.15.2.2.3.1. *See MSC.1/Circ.1582/Rev.1.*
 - (2) The inert gas main shall be fitted with branch piping leading to the cargo tank. Branch piping for inert gas shall be fitted with either stop valves or equivalent means of control for isolating each tank. Where stop valves are fitted, they shall be provided with locking arrangements. The control system shall provide unambiguous information of the operational status of such valves to at least the control panel required in 24.15.2.2.4. *See MSC.1/Circ.1582/Rev.1.*
 - (3) Each cargo tank not being inerted shall be capable of being separated from the inert gas main by:
 - (3.1) removing spool-pieces, valves or other pipe sections, and blanking the pipe ends; or

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- (3.2) arrangement of two spectacle flanges in series with provisions for detecting leakage into the pipe between the two spectacle flanges; or
- (3.3) equivalent arrangements to the satisfaction of the Register, providing at least the same level of protection.
- (4) Means shall be provided to protect cargo tanks against the effect of overpressure or vacuum caused by thermal variations and/or cargo operations when the cargo tanks are isolated from the inert gas mains.
- (5) Piping systems shall be so designed as to prevent the accumulation of cargo or water in the pipelines under all normal conditions.
- (6) Arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas. The arrangements shall consist of a 250 mm nominal pipe size bolted flange, isolated from the inert gas main by a valve and located forward of the non-return valve. The design of the flange should conform to the appropriate class in the standards adopted for the design of other external connections in the ship's cargo piping system. **See MSC.1/Circ.1582/Rev.1.**
- (7) If a connection is fitted between the inert gas main and the cargo piping system, arrangements shall be made to ensure an effective isolation having regard to the large pressure difference which may exist between the systems. This shall consist of two shutoff valves with an arrangement to vent the space between the valves in a safe manner or an arrangement consisting of a spool-piece with associated blanks.
- (8) The valve separating the inert gas main from the cargo main and which is on the cargo main side shall be a non-return valve with a positive means of closure.
- (9) Inert gas piping systems shall not pass through accommodation, service and control station spaces.
- (10) In combination carriers, the arrangement to isolate the slop tanks containing oil or oil residues from other tanks shall consist of blank flanges which will remain in position at all times when cargoes other than oil are being carried except as provided for in the relevant section of the guidelines developed by IMO, see Revised Guidelines for inert gas systems (MSC/Circ.353), as amended by MSC/Circ.387.

See IACS UI SC 62 Rev.1 (taking into account 24.1.1.1).

■ **Head 24.15 INERT GAS SYSTEMS**, sub-item 24.15.2.2.4 has been amended and should read as follows:

24.15.2.2.4 Indicators and alarms

- .1 The operation status of the inert gas system shall be indicated in a control panel. See *IACS UI SC 286*. **See MSC.1/Circ.1582/Rev.1.**
- .2 Instrumentation shall be fitted for continuously indicating and permanently recording, when inert gas is being supplied:
 - (1) the pressure of the inert gas mains forward of the non-return devices (see **MSC.1/Circ.1582/Rev.1**); and
 - (2) the oxygen content of the inert gas.
- .3 The indicating and recording devices shall be placed in the cargo control room where provided. But where no cargo control room is provided, they shall be placed in a position easily accessible to the officer in charge of cargo operations.
- .4 In addition, meters shall be fitted:
 - (1) in the navigating bridge to indicate at all times the pressure referred to in 24.15.2.2.4.2(1) and the pressure in the slop tanks of combination carriers, whenever those tanks are isolated from the inert gas main; and
 - (2) in the machinery control room or in the machinery space to indicate the oxygen content referred to in 24.15.2.2.4.2(2).
- .5 *Audible and visual alarms*
 - (1) Audible and visual alarms shall be provided, based on the system designed, to indicate:
 - (1.1) oxygen content in excess of 5% by volume;
 - (1.2) failure of the power supply to the indicating devices as referred to in 24.15.2.2.4.2;
 - (1.3) gas pressure less than 100 mm water gauge. The alarm arrangement shall be such as to ensure that the pressure in slop tanks in combination carriers can be monitored at all times;
 - (1.4) high-gas pressure; and
 - (1.5) failure of the power supply to the automatic control system.
 - (2) The alarms required in 24.15.2.2.4.5(1.1), 24.15.2.2.4.5(1.3) and 24.15.2.2.4.5(1.5) shall be fitted in the machinery space and cargo control room, where provided, but in each case in such a position that they are immediately received by responsible members of the crew.
 - (3) An audible alarm system independent of that required in 24.15.2.2.4.5(1.3) or automatic shutdown of cargo pumps shall be provided to operate on predetermined limits of low pressure in the inert gas main being reached. **See MSC.1/Circ.1582/Rev.1.**
 - (4) Two oxygen sensors shall be positioned at appropriate locations in the space or spaces containing the inert gas system. If the oxygen level falls below 19%, these sensors shall trigger alarms, which shall be both visible and audible inside and outside the space or spaces and shall be placed in such a position that they are immediately received by responsible members of the crew.

See IACS UI SC 287.

ANNEX 5

■ Note 6 to Table 1-1 has been amended and should read as follows:

6. Open spaces and spaces not capable of being sealed shall be fitted with pressure water-spraying system.
High-expansion foam system may not be fitted for container cargo spaces.
Fixed water spraying system shall be provided for open top container cargo spaces in lieu of the fixed gas fire-extinguishing system required (see *MSC/Circ.608 Rev.1*).
Equivalent fixed water-based fire-extinguishing systems (see *MSC/Circ. 1430/Rev.1*), approved by the *Register*, may be accepted in lieu of the fixed pressure-water spraying system required.
For protection of vehicle, special category and ro-ro spaces see also 20.6.1.